

# Role of laparoscopy in the management of impalpable testes

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## ABSTRACT

Both diagnostic and operative laparoscopy was used in the management of 189 impalpable testes. 66 were either vanishing or atrophied, 17 were found in the inguinal canal, 19 in the groin, and 87 intra-abdominal. Four of the latter group were associated with persistent Mullerian duct syndrome and one with splenogonad fusion. Four atrophied abdominal testes were excised laparoscopically, 47 were treated with one stage laparoscopic orchidopexy and 34 with laparoscopic Fowler Stephen (FS) procedure. A good scrotal position was achieved in 63% of the one stage procedure and 69% with the two stage FS approach.

**KEY WORDS:** Laparoscopy, undescended testis

## INTRODUCTION

Approximately 20% of undescended testes are impalpable, either because they are undetected clinically or sustain vascular injury during descent. Of all the available diagnostic modalities, diagnostic laparoscopy has proven to be the only modality that provides an accurate visual diagnosis upon which further management is contemplated. The present study was undertaken to evaluate the diagnostic and therapeutic value of laparoscopy in the management of impalpable testes.

## MATERIALS AND METHODS

From November 1995 to December 2005, we used diagnostic and/or operative laparoscopy in the management of 159 children with 189 impalpable testes. Their age varied from 1-13 years (mean 3.8 years). Our protocol consisted of examination under anesthesia followed by diagnostic laparoscopy and definitive treatment. In 19 patients the testes were noted to be in the superficial inguinal pouch despite repeated clinical examination. About 17 testes were seen entering the upper part of the inguinal canal and 87 were found at a variable distance proximal to the internal ring. Of the latter group we encountered one case of splenogonada fusion, four cases with Mullerian duct remnant and eight in sub-renal position.

The epididymis was partially dissociated from the testes and looped into the inguinal canal in 13 cases and in one case it was completely dissociated [Figure 1]. We

encountered 25 vanishing, 4 atrophied abdominal and 37 atrophied scrotal testes.

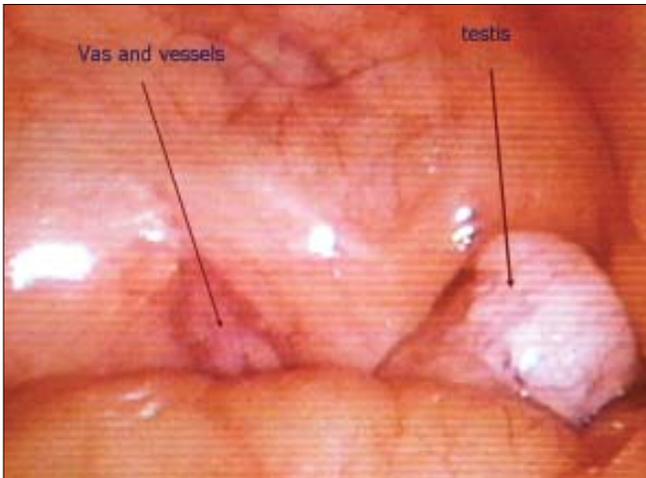
Open orchidopexy was carried out in 19 patient in whom testes were found to be at superficial inguinal ring and in 10 patients with canalicular position. Excision of atrophied remnants of testes was carried out in 25 atrophied scrotal testes via inguinal incision. Histopathology did not identify scrotal tissues in 22 and in three; there were immature testicular tissues.

One stage laparoscopic-assisted orchidopexy (LAO) was performed in 40 abdominal and seven high canalicular testes. The testicular vessels are dissected free from peritoneal attachment as high as possible and the testes are brought into scrotal sac via a direct rout medial to the internal ring.

Laparoscopic Fowler Stephen procedure (FS) was performed in 34 high abdominal testes. In the first stage 2 metal clips are applied to the testicular vessels 3 cm above the testis without any testicular mobilization [Figures 2 and 3]. In the second stage (3-6 months later) the vessels are severed between the two clips and the testes are brought down on the artery to the vas with wide base of peritoneal attachment to the scrotal sac via the direct rout.

## RESULT

In a follow-up between 6 months and 5 years, we have managed to achieve a satisfactory result (good size testes



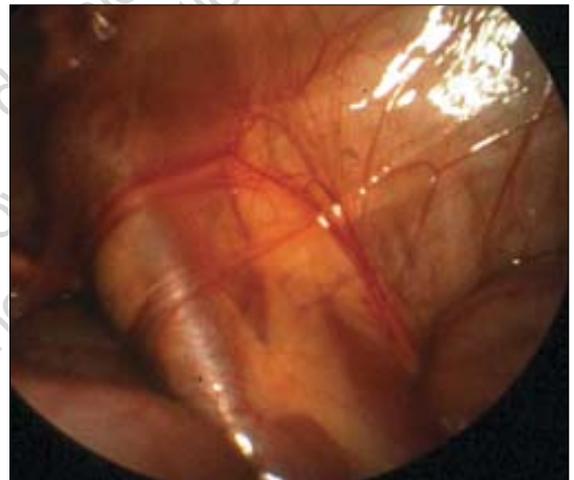
**Figure 1:** Complete dissociation between testis and cord



**Figure 3:** Second stage laparoscopic FS orchidopexy (notice the metal clips on the testicular vessels)



**Figure 2:** First stage laparoscopic FS orchidopexy



**Figure 4:** vanishing abdominal testis (vas and vessels ends above the closed internal ring)

in scrotal position) in 30 of the 47 (63%) in patients with one stage (LAO) and 22 of 32 (69%) of 2 stage laparoscopic (FS). A second stage open orchidopexy was carried out in 16 testes in the mid-scrotal and 11 of high scrotal position and a good scrotal position was achieved in 15; Six became atrophied and 11 were still at mid-scrotal position. The over all good result after the second stage open orchidopexy was 36 out of 47 (76%) in one stage LAO and 26 of 32 (81%) of (FS) procedure.

## DISCUSSION

Laparoscopy has been established as the most reliable diagnostic modality for the management of impalpable testes.<sup>[1-6]</sup> It clearly demonstrates the anatomy and provides visual information upon which a definitive decision can be made.

Both internal rings can be inspected; the location and size of the testes, their blood supply and the nature,

course and termination of the vas, and epididymis can be determined. All of these anatomical landmarks individually or collectively have bearing on the operative management of the impalpable testes.

All other diagnostic modalities (ultrasound, computerized tomography, magnetic resonance imaging and venography) have never attained such accuracy and are unreliable especially in the event of a negative result.<sup>[9]</sup>

19 patients after repeated clinical examination including examination under general anesthesia were found to have their testes in the superficial inguinal pouch. 11 of those were obese boys and six had emerging testes with complete hernial sac allowing the testes to pop in and out of the abdominal cavity.

Our criteria for diagnosing vanishing testes [Figure 4] are to see the vas and vessels ending blindly at or above closed internal ring.<sup>[10]</sup> Seeing the vas alone entering the

canal and ending into what looks like a nubbin of cord remnants does not diagnose absent testis. We have encountered one case in which the vas enters closed internal ring and a normal testis lying completely dissociated from the vas in the pelvis. This particular case would have been labeled as an atrophied testis, but for the diagnostic accuracy of laparoscopy. The explanation to these phenomena is related to the embryological development of the wofflian system separately from the testis with the gubernaculum attached to the epididymis rather than the testis.<sup>[11]</sup>

One stage LAO,<sup>[5-8]</sup> was attempted in 47 case cases seven of which were high abdominal testes. The testicular vessels are first mobilized retro peritoneally and testes are brought down to the scrotal sac via a direct rout created by a 3 mm incision into the scrotum through which a forceps is introduced to grasp and transfer the testis into scrotum. We have achieved a good scrotal position in 63% of the cases, mid scrotal in 25% and high scrotal in 15%. The latter poor outcome was associated with testes lying high above the internal ring. For this reason, we now restrict our LAO the testes lying just above the internal ring. The key to successful outcome is to be able to bring the testis to the contra lateral internal ring with no tension. A second stage redo orchidopexy was attempted in 10 of the mid and seven high scrotal testes 6–8 months after initial laparoscopy and we managed to bring seven to a normal scrotal position. The overall good result was 34 out of 45 (75%) [Tables 1-5].

Laparoscopic second stage (FS)<sup>[12-14]</sup> orchidopexy was performed for high abdominal testes. In the first stage we used two clips on the testicular vessels about 3 cm from the testes (30 cases) and recently we used diathermy (4 cases). During the second stage, we sever the vessels and bring the testes with a wide mesentery through a direct route medial to the internal ring. We achieved good scrotal position in 22 cases (70%) and mid scrotal position in six (18%). We lost the testes in four (12%). Follow up between 6 months and 4 years showed that two of the mid-scrotal cases settled in a good scrotal positing, but atrophied testes were noted in three cases. Two cases are at present waiting for a second stage laparoscopic orchidopexy.

In eight of the abdominal cases the testes were found to be in sub renal position, in which the vas was seen looping in the upward direction and ending in none descended testes. The initial findings of the first case diagnosed was that of a leach of flimsy vessels entering an opened inguinal canal, which would have been labeled as an absent testis, but for the careful abdominal inspection showing the upward direction of the vas deferens.

**Table 1: Laparoscopic findings of 189 impalpable testes**

Vanishing	25
Atrophic abdomen	04
Atrophic scrotum	37
SIP	19
Canalicular	17
Abdominal	87

**Table 2: Lapaparsopic finding of 87 abdominal testes**

High abdominal	45
Above ring	29
Subrenal	08
Müllerian	04
Spleno Gonadal F.	01

**Table 3: Operative procedure for abdominal testes**

One stage laparoscopic-assisted orchidopexy	47
laparoscopic Fowler Stephen	34
Laparoscopic orchiectomy	06

**Table 4: Results of one stage laparoscopic-assisted orchidopexy**

Good scrotal position	30
Mid scrotal position	10
Neck of scrotum	07

**Table 5: Results of laparoscopic Fowler Stephen**

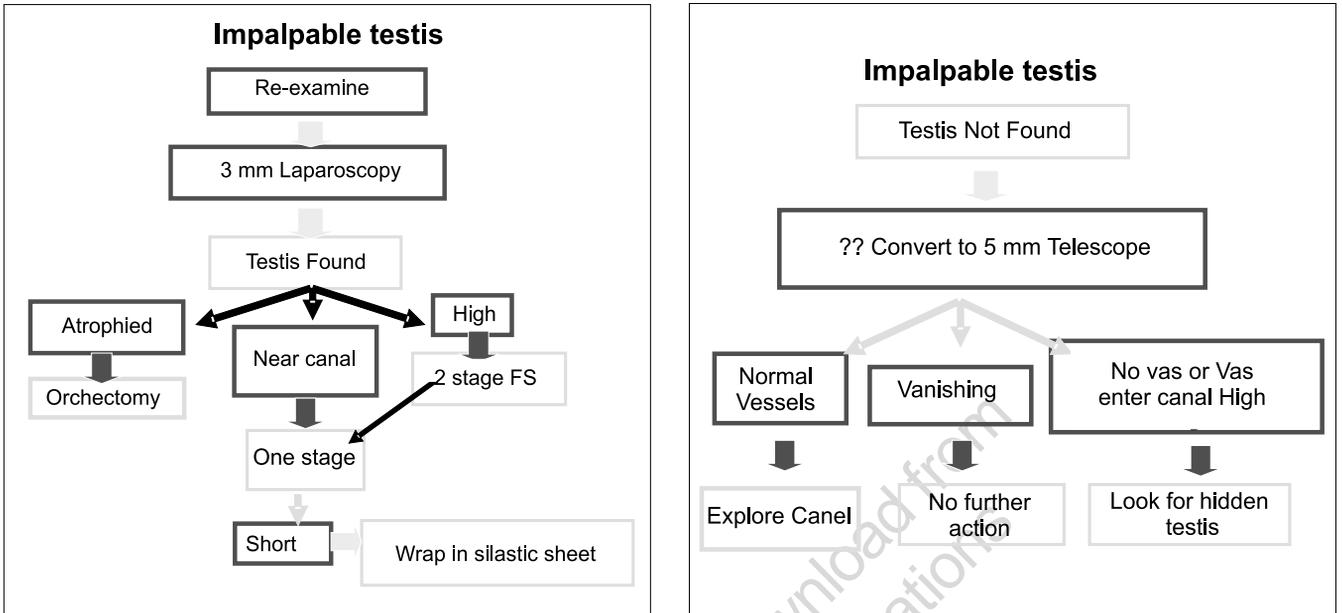
Good scrotal position	22
Mid scrotal position	06
High Scrotal	04

We strongly recommend careful exploration of the abdomen tracing the vas and vessels before labeling impalpable testes as absent. Canicular testes can be managed either by one stage (LAO) or open technique. We have used open orchidopexy in seven and LAO in 10. Testes were in mid-scrotal position in 2 of the 7 and 3 of the 10. We do recommend using the open technique in inguinal testes, as the results are comparable to the laparoscopic technique.

We prefer to wrap the testes in a Silastic sheath if we fail to bring it into a satisfactory position. This helps to identify the testis during the second exploration and helps to avoid injuring vital structures.

## CONCLUSION

Laparoscopy has proven to be the only diagnostic modality where the findings provide a clear dependable direction for the definitive management of impalpable testes. Testes of normal size and near the internal ring are preferably managed by laparoscopic one stage procedure. A laparoscopic (FS) two-stage procedure should be considered for those positioned high above the internal ring. An algorithm for management of



**Figure 5: Approach to impalpable testis** (References - Journal of Pediatric Surgery, Volume 32, Issue 6, June 1997, Pages 918-920 W. O'Hali, P. Anderson and M. Giacomantonio).

impalpable testes is highlighted.

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