Groin Exploration for the Nonpalpable Testes: A Single Center Experience

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ABSTRACT

Background: Management of non-palpable testes in Nigeria can be difficult due to late presentation and poor resources. Surgical exploration is often required for diagnosis and treatment. **Aim:** This study reviews the management outcome of clinically non-palpable testeis in a tertiary center in Nigeria. **Materials and Methods:** Ten years retrospective review of all clinically non-palpable testes in children aged 2–15years managed at the Obafemi Awolowo University Teaching Hospitals Complex Ile-Ife Nigeria. **Results:** Thirty two children with 44 testicular units were managed. The right side was involved in 12 (37.5%); left in 8 (25.0%) and bilateral in 12 (37.5%) patients. Pre-operative ultrasound was done in 12 patients with localization in just 4 patients (33.3% success rate).At groin exploration, 34 (77.32%) testicular units were located in the inguinal canal. Eight patients with 10 The remaining 10 (22.7%) testicular units required additional mini-laparotomy for which six (13.6%) and 4 (9.1%) testicular units respectively were either in the retroperitoneum or not found. Of the testes in the groin, twenty two (64.7%) testicular units were normal while 12 (35.3%) were atrophic. Four of the retroperitoneal testes were normal while 2 were atrophic. Eight (22.5%) testicular units among the inguinal group had multi-staged orchidopexy; while 2 each of the retroperitoneal group had orchidectomy,one stage orchidopexy, two staged Fowler Stephens (F-S) procedure or lost to follow up after first stage of F-S procedure. Mean follow up period was 2 months. 2 testicular units each had retracted or vanished respectively during follow up. Conclusion: Groin exploration still offers a viable approach Surgical exploration is still useful in to the management of non-palpable testes in low resource environment despite the lack of laparoscopy.

KEYWORDS: Exploration, groin, nonpalpable, testis, undescended

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INTRODUCTION

Undescended testis (UDT) is one of the most common surgical conditions in the pediatric age group. At birth, 3–8% of all boys have undescended testes, but most descend into the scrotum by age of 3 months.[1] The incidence of UDT is, however, higher in preterm infants approaching 30–45%.[2,3] All UDT should be brought to the scrotum as soon as possible preferably before the age of 2 years so as to reduce the increased risk of complications such as loss of potential for fertility[4,5] and increased risk of developing malignancy.[6] Most undescended testes are located either within the inguinal canal or outside the canal and are usually palpable. Palpable undescended testes can usually be brought down and fixed in the scrotum via the standard groin exploration and orchidopexy. The nonpalpable testes constitute about 20% of undescended testes in children.[7] The management of the nonpalpable undescended testes remains variable depending on available facilities and can be very challenging. In developed centers, the use of laparoscopy introduced by Cortesi *ds `k.* in 1976[8] for preoperative localization of the nonpalpable testes prior to surgical intervention is commonly practiced although the use of the procedure is evolving in many developing centers too. Laparoscopy enables the evaluation of the position, size, and the structural normality of intra-abdominal testes. Other investigations such as magnetic resonance imaging (MRI), high resolution ultrasound (USS) and arteriography may also be helpful in preoperative localization of the impalpable testes but are not as sensitive with an average accuracy of 44%.[9] In developing countries, apart from late presentation, management of the nonpalpable testes can be difficult because of lack of resources. Before the advent of laparoscopy, impalpable testes were managed routinely by groin exploration which may be extended to include retroperitoneal dissection and in some cases laparotomy. In centers where laparoscopy is not available, this is still the only available option. The aim of this study is to review the outcome of routine trans-inguinal exploration in the management of the clinically impalpable testes in a tertiary center from a developing country.

Materials and Methods

A retrospective review of all cases of clinically impalpable undescended testes managed at the Obafemi Awolowo University Teaching Hospitals, Ile Ife, Nigeria over a 10-year period January 1998 to December 2007 was done. Information on the age at presentation, side involved, type of investigation done, mode of management, operative findings and outcome were recorded in a proforma. USS evaluation was not routinely done until much later. The request for USS was at the discretion of the surgeon. No laparoscopy was done on any patient. All patients were explored through the standard groin incision which was extended as necessary. If the testis was found, a traditional orchidopexy (groin plus scrotal incision to create sub-Dartos pouch) was done in one or two-stages depending on the surgeons' assessment of the length of the cord after initial mobilization. For those who had two-staged standard orchidopexy, the second stage was done after a minimum of 6 months. In those in whom the testis cannot be located in the groin after extended groin incision, a mini-laparotomy was done via a transverse incision over the iliac fossae and if the testes was located, the testicular vessels were divided to be followed by testicular mobilization on the vasa arteries 6 months later (two-stage Fowler-Stephens [FS] orchidopexy). At surgery, the testis were classified as normal, hypoplastic or atrophic when compared by palpation with the opposite testes. Where there were bilateral UDT the testes were classified based on gross appearance of the testes combined with consistency on palpation. This assessment is however highly subjective as the terms atrophic and hypoplastic were used interchangeable as there was no biopsy done. Follow-up was done in the clinic assessing for complications of orchidopexy, the location of the testicle (s) and their size. Data were analyzed using descriptive statistics.

Results

Thirty-two children with impalpable testes were managed during the study period. The right side was involved in 12 (37.5%), the left side in 8 (25%) and bilateral in 12 (37.5%) patients giving a total of 44 testicular units. The age range at presentation was 24–156 months (median 72 months). Two of the patients had had exploration at another center before presentation where the testicles were not located. Associated abnormalities were found in six patients, and these were inguinal hernia 2 (6.25%) patients, hypospadia 2 (6.25%) patients and micropenis 2 (6.25%) patients. Preoperative USS was done in 12 patients. The USS was able to locate the testes in 4 (33.3%) patients (just distal to the deep ring in the four patients). The USS findings in the four patients were confirmed at surgery. All the patients had groin exploration as their initial mode of management. The age at exploration was 25–156 months (median 72 months). Inguinal exploration was done within 1-month of presentation in all patients. At exploration, 34 (77.2%) testicular units were located in the inguinal canal, 19 (55.9%) of them at or near the internal inguinal ring while 15 (44.1%) were in the canal proper. Eight patients with 10 testicular units required mini-laparotomy following initial groin exploration. Six (13.6%) testicles were located retroperitoneally in the right iliac fossa following laparotomy while 4 (9.1%) testicular units could not be located and were classified as absent [Table 1].

The testes were considered normal in 22 (64.7%) testicular units located in the inguinal canal while they were hypoplastic in 12 (35.3%) patients (all aged more than 5 years). Among the six abdominal testes, only 4 were considered viable while the other two were either atrophic or hypoplastic.

All the patients that had inguinal testes (whether hypoplastic or atropic) were offered orchidopexy and all the testicles were successfully placed in the scrotum. This was because the parents declined orchidectomy when offered. Eight of them (23.5%) however required multi-stage orchidopexy. No testicular unit was lost before the second stage orchidopexy. Of the patients with abdominal testes, orchidectomy was done in two patients while two patients had a two-staged F-S orchidopexy. The remaining two patients had high division of the testicular vessels as part of the F-S orchidopexy, but failed to return for the second stage.

Majority of the patients (78.1%) were operated as day cases while 9 (21.9%) required admission for between 1 and 4 days (median 3 days) either because of extensive dissection (one patient) or following laparotomy (eight patients).

During a follow-up period ranging from 1-week to 6 years (median 2 months), 2 testes (5.5%) had retracted to the inguinal canal necessitating redo orchidopexy. These two patients initially had the testes located at the deep ring. Two (5.5%) other testes could not be palpated again. One of these two had the F-S procedure.

Discussion

The UDT is one of the most common pediatric surgical problems worldwide.[1] Before the advent of laparoscopy, nonpalpable testes were managed routinely by groin exploration, which may be extended to include retroperitoneal dissection and in some cases laparotomy if neither testis nor cord structures could be found. This is the approach that was used in our hospital during

Table 1: Location of the testes, treatment and outcome

Location of testes (*n*=44)	Treatment	Outcome
Inguinal canal		
Inguinal canal proper (*n*=15)	Single stage orchidopexy=15	All testes palpable
At level of internal ring (*n*=19)	Single stage orchidopexy=11	16 testes palpable
	Two stage orchidopexy=8	2 testes retracted 1 testis disappeared
Abdominal (*n*=6)	Ochidectomy=2	
	Two stage F-S procedure=2	1 testis palpable 1 testis dissappeared
	First stage of F-S procedure=2	Lost to follow-up
Absent testes(*n*=4)	No further treatment	

F-S: Fowler Stephens

the study period. This approach was successful in locating 91% of the testicular units. There is a variety of reasons why a testis may not be palpable. These include poor examination technique, uncooperative child, and obesity, intra-abdominal location of the testis, testicular atrophy or agenesis. Repeated examination and use of ancillary investigations may help in localizing or excluding such impalpable testis. Although laparoscopy has gained worldwide acceptance as the gold standard for investigating nonpalpable testes some authors still believe that the primary groin exploration still has a role in the management of nonpalpable testes. Williams *ds `k*.[10] have shown that 95% of nonpalpable testes can be localized through an inguinal incision with or without extension. Others have advocated inguinal exploration in cases of unilateral nonpalpable testis instead of laparoscopy especially when the contralateral testis is enlarged, suggesting monorchidism.[11-13] However, if the descended testis is not enlarged, there is a greater likelihood of a viable testis and one may choose laparoscopy where the facility is available.

While the best approach to the management of the impalpable testis still remains controversial, preoperative localization where possible, helps in the planning of surgical approach to the impalpable testis. Advocates of initial diagnostic laparoscopy infer that the procedure can be performed without unnecessarily increasing the operating time. A study by Chandrasekharam[14] could not demonstrate any advantage of preoperative laparoscopy over groin exploration in patients with nonpalpable testes. Furthermore, García Palacios *ds `k*.[15] found that 80% of children with nonpalpable testes subjected to initial laparoscopic approach needed a groin approach later compared to 11% of those subjected to initial groin approach requiring laparoscopic examination. A variety of imaging modalities has been used to detect the impalpable testis preoperatively. These include USS[16] computed tomography (CT), and MRI, as well as more invasive procedures such as arteriography and venography. USS is cheap and is widely available but is dependent on the operator and the sensitivity of the probes. In this series, it was only helpful in a third of patients in whom it was requested. Some authors believed that USS is unnecessary in the evaluation of boys with UDT.[12] CT is too expensive, associated with high radiation while MRI scan is not available in most developing countries. Moreover none are as sensitive as laparoscopy for accurate localization of the testes, especially the intra-abdominal testis.[17,18]

One of the advantages of the initial laparoscopy in the evaluation of children with unilateral nonpalpable UDT is to avoid unneeded inguinal exploration and hence an avoidable surgical scar. In our study, laparotomy was done in 8 (25%) patients and in 50% of them the testes were not found. Diagnostic laparoscopy would have averted unnecessary laparotomy in these patients. On the other hand, there was a high success rate with our approach of traditional groin exploration for impalpable undescended testes in this study. The reason for this may be that some of the testes may have been missed at diagnosis because of poor technique or noncooperation of the patients. More than half of the testes located in the inguinal canal were located in or near the internal ring of the inguinal canal. These testes would be classified as emergent testes, which are easily manipulated into the internal ring and thus easily repaired by simple or staged orchidopexy.

The limiting factor for orchidopexy in the high intra-abdominal testis in most cases is the short length of the testicular vessels. These testes require vasal based orchidopexy of F-S[19] or microvascular orchidopexy.[20] Laparoscopy assisted orchidopexy as part of the FS procedure is done by some while the others prefer to do a microvascular transfer of the testis

Four patients in this series were planned for the F-S procedure. Only two of the patients complete the two-staged surgery. However, only one of the testes was viable at follow-up.

The success rate with microvascular orchiopexy varies between 60% and 96%.[21,22] This procedure requires specialized training and is not readily available in many centers including many developed ones.

Complications following orchidopexy are not uncommon. Major early complications include pain, hematoma, infection, and anesthetic side effects may occur. Testicular retraction or atrophy has been reported to occur in a frequency of 0–2% of patients and postoperative hernia has been noted in 2–3% of cases after orchiopexy.[1] In addition, surgery may result in Sertoli and Leydig cell dysfunctions on long term follow-up. In this study, however, despite the high salvage rate in the patients studied it should be noted that a significant number of the testes were atrophic at surgery. Poor follow-up would preclude making a categorical statement on the long term outcome of the testes.

Conclusion

Groin exploration still offers a viable approach to the management of the nonpalpable testes in low resource environment despite the lack of laparoscopy.

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