

Single port laparoscopic orchidopexy in children using surgical glove port and conventional rigid instruments

Ben Dhaou Mahdi, Chtourou Rahma, Jallouli Mohamed, Zitouni Hayet, Mhiri Riadh

Department of Pediatric Surgery, Hedi Chaker Hospital, School of Medicine of Sfax, University of Sfax, Sfax, Tunisia

Purpose: We review the literature and describe our technique for laparoendoscopic single-site orchidopexy using a glove port and rigid instruments. We assessed the feasibility and outcomes of this procedure.

Materials and Methods: We retrospectively reviewed the case records of all children who had undergone laparoendoscopic single-site orchidopexy by use of a surgical glove port and conventional rigid instruments for a nonpalpable intraabdominal testis between January 2013 and September 2014.

Results: Data from a total of 20 patients were collected. The patients' mean age was 18 months. All cases had a nonpalpable unilateral undescended testis. Fourteen patients (70%) had an undescended testis on the right side and six patients (30%) had an undescended testis on the left side. Seventeen patients underwent primary orchidopexy. Three patients underwent single-port laparoscopic Fowler-Stephens orchidopexy for the first and the second stage. Average operating time was 57 minutes (range, 40 to 80 minutes). No patient was lost to follow-up. At follow-up, 2 testes were found to have retracted out of the scrotum and these were successfully dealt with in a second operation. One testis was hypoplastic in the scrotal pouch. There were no signs of umbilical hernia.

Conclusions: Single-port laparoscopic orchidopexy using a glove port and rigid instruments is technically feasible and safe for various nonpalpable intraabdominal testes. However, surgical experience and long-term follow-up are needed to confirm the superiority of this technique.

Keywords: Laparoscopy; Orchiopexy; Testis

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INTRODUCTION

Laparoscopy represents the gold standard for the diagnosis and treatment of a nonpalpable intraabdominal testis (NPAT), which makes up around 20% of cases of undescended testis [1]. With the evolution of minimally

invasive surgery, the operative approach toward orchidopexy for NPAT has shifted from a traditional open approach to a multiport and single laparoscopic technique. The aim of this study was to evaluate the feasibility of orchidopexy for an NPAT by use of a surgical glove port and conventional rigid instruments.

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Corresponding Author: Chtourou Rahma

Department of Pediatric Surgery, Hedi Chaker Hospital, 3029 Sfax, Tunisia
TEL: +21625047786, FAX: +21674241384, E-mail: chtourourahma5@gmail.com

MATERIALS AND METHODS

We retrospectively reviewed all cases of patients with NPAT who had undergone laparoendoscopic single-site (LESS) orchidopexy at our department between January 2013 and September 2014. Throughout the study period, LESS was done by using a small size port (ROSE PORT).

All families consented to the single-incision approach and possible conversion to multiport laparoscopy. The medical records of the patients were reviewed, and data concerning age, weight, operative time, complications, and surgical outcome were collected.

As we previously described [2], we initially made a transumbilical glove port using a flexible ring (FR), a rigid larger ring (RR), one powder-free surgical glove, a wire-to-skin, and standard laparoscopic trocars. The fingertips of the glove were cut off where the trocars were inserted and fixed by a Vicryl 3/0 ligature wire. Then, the open end of the glove was passed through the FR and turned around it in the middle of the glove (Fig. 1).

A 1-cm incision was made at the level of the umbilicus without dissection of subcutaneous tissue. After the incision, the inner FR, fitted with the glove, was introduced into the abdomen. The open end of the glove was then wrapped around the outer larger ring. Carbon dioxide insufflations could be performed through any of the trocars.

A 30° angle laparoscope with 3-mm or 5-mm straight rigid instruments identical to those for conventional laparoscopy including graspers, scissors, and electrocautery was used to perform our LESS orchidopexy (Fig. 2). We opted for the first stage of two-stage Fowler-Stephens orchidopexy if the testis was closer to the iliac vessels. The remaining details of the orchidopexy were the same as for the multiport procedure. No other trocars were used for any

of the procedures.

RESULTS

LESS orchidopexy was performed in a total of 20 boys in our department. Their age ranged from 9 months to 24 months (mean age, 18 months). All patients had a nonpalpable unilateral undescended testis, which was on the right side in 14 patients and on the left side in 6 patients. Seventeen patients underwent laparoscopic orchidopexy without vessel division as a one-stage procedure and 3 patients had LESS Fowler-Stephens orchidopexy for the first and the second stage. LESS orchidopexy was possible in all selected cases without conversion. Average operating time was 57 minutes, with extremes ranging from 40 to 80 minutes. The mean operative time for those undergoing one-stage orchidopexy was 57.11 minutes (range, 40 to 80 minutes), that for primary Fowler-Stephens orchidopexy was 24 minutes (range, 20 to



Fig. 2. Surgical glove port with conventional rigid instruments.



Fig. 1. Glove port ready for insertion.



Fig. 3. Postoperative photography showing umbilical incision.

26 minutes), and that for second-stage surgery was 56.66 minutes (range, 56 to 58 minutes). Neither intraoperative nor postoperative complications were seen and the patients were discharged within a few hours of surgery. No patients were lost to follow-up. The total duration of the follow-up period ranged from 3 months to 1 year, 6 months. One patient had atrophy after the Fowler-Stephens orchidopexy procedure, and two cases had reascension of the testicle. No scoring was done to evaluate the final scar. However, the umbilical incision was nearly invisible and much appreciated by the parents. There were no signs of umbilical hernia (Fig. 3).

DISCUSSION

The question arises, why did we choose this technique to perform orchidopexy for NPAT? In fact, society pushes us to remain up to date and even be ahead of our time, but not at any price, in terms of potential complications and financial costs, especially in the pediatric population. It is for these reasons we chose LESS, which has gained popularity over the last decade. LESS has been previously described for various procedures in adults [3] and children [4]. In addition, these approaches offer documented benefits including improved cosmetic outcomes, decreased pain, and the ability to easily perform combined procedures without having to place additional ports [5].

LESS procedures can be performed with the R-port, Uni-X port, and SILS port, which are very costly. The Alexis wound retractor, curved instruments, and flexible-tip laparoscope are not available in our country. Therefore, we chose a less expensive access method to perform orchidopexy for NPAT, known as a “surgical glove port” or “homemade single-port,” which was described previously for the completion of various procedures in adults [6]. Our technique may be an alternative to the costly commercially available single-port systems, especially in a developing country [2].

To our knowledge, this technique has been previously used for orchidopexy in a pediatric population by only four authors. Sultan et al. [7] used an R-port in a 2-year-old boy; Raju et al. [8] and de Lima et al. [9] used rigid instruments in an 18-month-old child and for 3 boys, respectively; and Noh et al. [10] reported a series of 17 patients in which a multichannel single port and flexible tip laparoscope were used. All of these studies showed LESS orchidopexy in children to be feasible, safe, and scarless, with no intraoperative complications.

In terms of technical considerations, the single-incision technique allows adequate visualization and counter traction for performing orchidopexy, especially with a

standard instrument. However, it requires significant coordination between the surgeon and the camera holder. The instruments are usually crossed at the access port into the abdominal cavity. This problem has been resolved by the use of curved instruments [11].

The mean operative time for LESS orchidopexy in this report was longer than in the series reported by Noh et al. [10], probably because of the use of the flexible tip laparoscope, but it was shorter than the time reported by Raju et al. [8], who reported a technique using standard trocars through a single umbilical incision with an intraabdominal time of 126 minutes. The time reported by de Lima et al. [9] was almost the same as in our first 3 patients. In fact, when the first 10 operative single-incision cases were compared with the second 10 cases, a trend toward a shorter operative time was noted, but this was not statistically significant. This suggests that the learning curve to perform this operation is short.

Decreased postoperative pain, as a theoretical benefit of LESS, requires further investigation. Recently, Zani et al. [5] reported that LESS seems to be associated with more postoperative pain than standard laparoscopy. But a meta-analysis described by Saldana et al. [12] showed similar pain scores with both techniques. In this study, the postoperative pain score was not analyzed because this score did not correlate with the requirement for additional analgesics. All patients were very satisfied with the cosmetic result.

CONCLUSIONS

This is one of the largest series of pediatrics patients to undergo LESS orchidopexy and the only pediatric study to have been done with a surgical glove port. Our results demonstrate the safety and feasibility of this procedure, which can be an alternative to costly commercially available single-port systems, especially in a developing country.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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