The contribution of intraoperative transinguinal laparoscopic examination of the contralateral side to the repair of inguinal hernias in children

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**Background:** Bilateral inguinal hernias are relatively common in children. This fact has led to a controversy of more than 50 years concerning the necessity of bilateral surgical exploration during the repair of unilateral inguinal hernias in children. The advent of transinguinal laparoscopic visualization of the contralateral side is a turning point and a major contribution to the subject, offering the opportunity to reassess the systematic bilateral exploration and the "wait and see" policies currently in use at most services of pediatric surgery.

**Data sources:** The current information concerning intraoperative transinguinal laparoscopic evaluation of inguinal hernias in children was summarized in a didactic way. A MEDLINE search (PubMed) from 1995 to the present days was conducted.

**Results:** A patent processus vaginalis (PPV) is not equal to a future symptomatic hernia. There is still no definitive evidence on which PPVs will become a hernia (5.8% to 11.6%) and which remain clinically insignificant. Diagnostic intraoperative transinguinal laparoscopic evaluation of the contralateral side is today the most simple and accurate way to reduce the incidence of negative explorations.

**Conclusion:** Diagnostic intraoperative transinguinal laparoscopic evaluation of the contralateral side during pediatric inguinal hernia repair is a simple, accurate, fast, and effective method to assess the contralateral processus vaginalis, improving decision-making, reducing the number of negative explorations, and sparing the surgeon the embarrassment associated with the appearance of a metachronous hernia at a later date. It is easily learned and should be part of every pediatric surgeon's practice.

**Key words:** bilateral exploration; inguinal hernia; laparoscopy; processus vaginalis

**Introduction**

Bilateral inguinal hernias are relatively common in children, with a frequency of 0.8% to 4.4%, higher in the first year of life, with a peak in the first month. This fact, backed by the strong influence of some prominent pediatric surgeons, led to a controversy lasting nearly 50 years concerning the necessity of bilateral surgical exploration during the repair of unilateral inguinal hernias in children. The advent of laparoscopic visualization of the contralateral side is a turning point and a major contribution to the subject. This review summarizes the current information concerning intraoperative transinguinal laparoscopic examination of the contralateral inguinal ring during inguinal hernia repair in children, suggesting a reassessment of systematic bilateral exploration and the "wait and see" policies currently in use at many services of pediatric surgery around the world.

**Surgical exploration of the contralateral groin in children with unilateral inguinal hernias**

Rothemberg and Barnet, as far back as 1955, reported their personal experience in the treatment of inguinal hernias in children. All infants under 1 year of age and 65.8% of children over 1 year of age were found to have hernias on both sides during exploration. Their conclusion was that bilateral exploration should be performed.[1] Minton and Clatworthy[2] reported in 1961 a series of 600 children who underwent bilateral operation for an
obvious unilateral inguinal hernia and in whom a patent processus vaginalis (PPV) was found on the contralateral side in 59.3% of children from birth to 16 years of age. The incidence was 77% in the first 3 months of life. They found bilateral exploration justified if the surgery could be expeditiously accomplished. Sparkman[9] reviewed the pros and cons of exploring the contralateral side in 1962, concluding that it should be the surgeon’s choice to either accept or reject the policy of routine exploration. McVay[4] in 1965 was the first to question the routine bilateral exploration of inguinal hernias. He found the incidence of bilateral hernias to be only 18%, not justifying exploration of the contralateral side. Many years later, McGregor and the same McVay reviewed their 32-year span experience in the treatment of infant hernias, finding bilateral exploration not justified for two reasons: first, a number of unnecessary procedures would be performed; and second, the risk of bilateral testicular trauma would be too great.[5] In 1993, Surana and Puri[6] reviewed 551 patients who underwent unilateral inguinal herniotomy and found that only 9.8% of them subsequently developed a contralateral hernia, making their case against routine contralateral exploration.

Classical indications for contralateral exploration include children less than 1 year of age, girls with left inguinal hernia and children with ventriculoperitoneal shunts, peritoneal dysaliasis or ascitis. The first indication is changing as the result of a new policy due to transinguinal laparoscopic examination (TIL) of the contralateral side during repair of inguinal hernias in children. The most efficient approach to the problem of systematic bilateral exploration would be to define a patient group with high risk for metachronous hernias (MHs) and then apply diagnostic tests or TIL to that group of patients. If the surgeon does not believe in this more selective approach to the asymptomatic side, then closer follow-up would be justified. We have been through all the different approaches of the last decade and came to the conclusion that a long standing controversy does not justify a "wait and see" approach to the problem. Advantages of contralateral examination include detection of a "subclinical" hernia and hence potential reduction of complications, a decrease in the number of operations required and alleviation of parental anxiety. Avoiding the risk of injury to the contralateral spermatic cord structures and the relatively low risk of a MH are the main advantages to limiting the repair to only the symptomatic side. Systematic bilateral exploration and the "wait and see" policies have their price. The controversy and the therapeutic options are still open, but the laparoscopic evaluation of the other side at least gives you the opportunity to "see" the contralateral side and make decisions based on what you see and in what your personal experience tells you. It brings you down from a more philosophical to a more practical decision, a better decision based on surgical experience. Transinguinal diagnostic laparoscopy is a feasible and easy technique in children, with a minimal complication risk. We suggest its use as the most reliable method for the evaluation of the contralateral inguinal region in children when repairing inguinal hernias.

The largest cohort study in the literature,[7] a retrospective study of 6302 patients presenting with inguinal hernia to a single surgeon’s practice over 35 years, concluded that as the overall rate of MHs in children is low (5.2%) and the risk of incarceration is 0.7%, they do not advocate routine contralateral exploration. They also found that a primary left-sided hernia is associated with two-fold increased odds of developing a contralateral hernia, with a median time of 1 year. Therefore, this higher risk population should receive a closer follow-up over this period. They agreed with Burd et al[8] in that patients at "low" risk for MHs are appropriate candidates for a "wait and see" approach, while those at "high" risk for MHs would benefit from laparoscopic exploration of the contralateral side.[9] Looking at the subject from yet another angle, the important parental perspective regarding the controversial issue discussed here was reported by Holcomb et al[10] in 2004. When presented all the different options regarding management of a unilateral inguinal hernia, parents preferred laparoscopic examination and repair of the contralateral region, if needed, more for convenience than for concerns about a second procedure and anesthesia. A complete and fascinating historical overview on the treatment of pediatric inguinal hernias was reported by Rathauseter[11] in 1985.

Potential complications associated with routine exploration of the contralateral groin

Routine exploration of the contralateral groin when performing inguinal hernia repair in children presents a 1.6% risk of vessel injury. Other potential complications include testicular atrophy (1%-2%), decreased testicular size (2.7%-13%), testicular malposition, and wound infection. The vulnerability of the vas deferens, the most important issue when assessing the validity of contralateral exploration of unilateral inguinal hernias in children, was assessed experimentally by Shandling and Janik.[12] They found that even finger compression of the vas deferens for 30 seconds can cause variable inflammatory reactions and potential secondary obstruction, not only grasping or clamping with a hemostat, as usually believed. They revealed a 10% incidence of vessel luminal narrowing following even gentle manipulation of the cord during dissection. Their work was a major contribution to hernia surgery in