Contralateral Inguinal Exploration in Males under 2 Years with Unilateral Inguinal Hernia: Is it Justified?

Ahmed Hammad1, Ahmed M Abdel Modaber2* and Vusal Aliyev2

1Department of General Surgery, Mansoura University Hospitals, Egypt
2Department of General Surgery, Emsey Hospital, Turkey

Abstract

We noticed from literature how common inguinal hernia in pediatric patients is and that herniotomy is considered the most common procedure performed by pediatric surgeons. Routine Contralateral Inguinal Exploration (CIE) in patients suffering from unilateral hernia is one of the most debated issues in pediatric surgery. This controversy began with the report published in the middle of fifties reporting that in children with inguinal hernias, (100%) of those younger than 1 year and (68.5%) of those older than 1 year had bilateral hernias and the debate continues till now. Proponents of routine CIE built their opinion on the high incidence of bilaterality in infants and the fact that identifying and ligating CPPV will prevent the possibility of inguinal hernia development in the future and avoiding all the issues associated with the development of a contralateral hernia, including parental anxiety, cost, anesthesia, and risk of contralateral incarceration. While, opponents of routine CIE built their opinion on the fact that PPV is not a true hernia and the presence of a patent processus does not imply that the patient will go on to develop a metachronous hernia as not all PPV will develop to be IH. So, many patients will be exposed to unnecessary procedure they don’t need with its possible complications that may affect the fertility of patients and include vas deferens injury, testicular atrophy and iatrogenic testicular ascent. It has traditionally been believed that the contralateral processus vaginalis obliterates during the first few months of life in 40% of newborns. Another 20% of those children will close their PPV over the next two years. Of the remaining 40% of children with a CPPV, roughly half will go on to develop a clinically apparent inguinal hernia. If this is true, then the identification and closure of a CPPV at the time of ipsilateral hernia repair will obviate the need for a second operation in thousands of children every year. It will, however, also expose a similar number of children to an unnecessary operation on the contralateral groin and to get accurate incidence of MCIH this may require a lifelong follow up. The debate continues and all the time authors are trying to find a good alternative to routine CIE in those patients with unilateral hernias. This started by depending on proper history taking plus thorough physical examination, passing through (Herniogram, Bakes dilators and diagnostic pneumoperitoneum) till reaching the era of laparoscopy. Many authors recommended that Laparoscopy may be the ideal tool to diagnose a contralateral patent processus vaginalis intraoperatively as it is sensitive, specific, fast, and safe. But there is still a debate on the criteria of contralateral internal ring that indicate operating on the contralateral groin to avoid the need with its possible complications that may affect the fertility of patients and include vas deferens injury, testicular atrophy and iatrogenic testicular ascent. It has traditionally been believed that the contralateral processus vaginalis obliterates during the first few months of life in 40% of newborns. Another 20% of those children will close their PPV over the next two years. Of the remaining 40% of children with a CPPV, roughly half will go on to develop a clinically apparent inguinal hernia. If this is true, then the identification and closure of a CPPV at the time of ipsilateral hernia repair will obviate the need for a second operation in thousands of children every year. It will, however, also expose a similar number of children to an unnecessary operation on the contralateral groin and to get accurate incidence of MCIH this may require a lifelong follow up. The debate continues and all the time authors are trying to find a good alternative to routine CIE in those patients with unilateral hernias. This started by depending on proper history taking plus thorough physical examination, passing through (Herniogram, Bakes dilators and diagnostic pneumoperitoneum) till reaching the era of laparoscopy. Many authors recommended that Laparoscopy may be the ideal tool to diagnose a contralateral patent processus vaginalis intraoperatively as it is sensitive, specific, fast, and safe. But there is still a debate on the criteria of contralateral internal ring that indicate operating on the contralateral patent processus vaginalis. The overall incidence of MCIH ranges from 7 to 15% as shown in the latest meta-analysis study in 2006. The purpose of that literature review was to assess the risk of MCIH in children younger than 19 years old and to assess whether age, sex, and side of initial hernia and length of follow - up after surgery affect that risk. We found in this study that the incidence of MCIH in 100 full term males younger than 2 years after unilateral herniotomy and a follow up period of 12 months was 7% with a higher incidence in patients presented initially with left OIH. We found that routine CIE is not justified in full term males below 2 years of age presenting with unilateral OIH except in some conditions.

Keywords: Unilateral inguinal hernia; Contralateral inguinal exploration

Introduction

Inguinal hernias and hydroceles are among the most common pediatric surgical problems and inguinal hernia repair is one of the most common operations performed by pediatric surgeons. The incidence of indirect inguinal hernia in term neonates is about (3.5% to 5%), which increases in premature neonates to reach (9% to 11%). Inguinal hernia is more common in boys (male to female ratio is about 5:1 to 10:1). Few topics in pediatric surgery have drawn as much attention or generated
Ahmed M Abdel Modaber, et al., Clinics in Surgery - General Surgery

At the outpatient clinic. Those who did not attend the follow up visits hernia at 1 week, 3 months, 6 months and 12 months after the surgery alternative exploration means.

The contralateral side was not explored surgically or by any investigation to detect the presence of inguinal hernia in the contralateral side as long as it was not diagnosed from history and clinical examination. The relevant issues in the debate revolve around the frequency of occurrence of contralateral hernias and the relation of this to age, gender, and side of the clinically apparent hernia [1]. In this study we are trying to know the frequency of occurrence of contralateral inguinal hernia in full term boys below 2 years old after unilateral inguinal hernia repair in order to determine if routine contralateral inguinal exploration in this age group is justified or not.

Patients and Methods

This is a prospective study of 100 full term males below the age of 2 years presenting with unilateral inguinal hernia.

The criteria for diagnosis were a history of groin mass and positive findings such as a reducible scrotal or inguinal mass, cord thickening, or a silk-glove sign on physical examination. In this study we did not use any investigation to detect the presence of inguinal hernia in the contralateral side as long as it was not diagnosed from history and clinical examination. Preterm babies (gestational age less than 36 weeks), females, children older than 2 years. Those who had bilateral IH, and patients with ascites, collagen disease, hydrocephalus with a ventriculo - peritonial shunt (VPS), were excluded from the study. An open inguinal herniotomy was performed unilaterally regardless of the side of involvement unless obvious signs of a hernia were evident on the contralateral side, in which case bilateral repair was carried out. The contralateral side was not explored surgically or by any alternative exploration means.

Patients were followed up for the development of contralateral hernia at 1 week, 3 months, 6 months and 12 months after the surgery at the outpatient clinic. Those who did not attend the follow up visits were contacted by telephone and those who did not attend follow up visits or could not be contacted by telephone were excluded from the study.

The incidence of contralateral hernia and its risk factors were analyzed putting in mind the age at initial herniotomy, initial side of hernia, the time interval between the surgery and the development of contralateral hernia, and if any complications occurred on second presentation. Also hospital charges for unilateral and bilateral herniotomy were estimated and cost analysis was done to verify if there is a significant cost difference.

Results

From a total number of 317 patients presented with inguinal hernias, 289 (91%) were males and 28 (9%) were females (excluded from the study). In (Table1), patients presented with bilateral OIH were 79 (25%) and those presented with unilateral OIH were 238 (75%) from them 59.2% (141) presented with right OIH and 40.7% (97) presented with left OIH. Their age ranged from 2 weeks to 12 years at the time of surgery. Patients less than 5 years of age represented 2.2% (227) from the total number of patients with OIH in this period while those older than 2 years represented 28.4% (90%) of patients (Table 1). Males below 2 years old were 208 representing 65.6% from the total number and 91.6% from patients younger than 2 years. Sixty two (62) patients of them presented with bilateral hernia (29.8%) and so they were excluded from the study and 15 patients were preterm (7.2%) presented with unilateral OIH and so contralateral inguinal exploration were done for them and were also excluded (Figure 1).

In (Table 2), full term males below 2 years old presented with unilateral inguinal hernias were 200 patients representing 41.3% from the total number of patients and 68.5% from males younger than 2 years with age ranging from 1 month to 24 months at time of initial herniotomy. The first consecutive 100 Patients of this group were followed up for a minimum of 12 months after initial unilateral herniotomy for the development of contralateral hernia. Patients who were lost during the follow up period due to any reason were replaced by others from the same group and in their order according to date of initial herniotomy (Table 2). We found in the final study group of patients (100 patients) that, 55% of them were below 1 year old and 61 patients (61%) presented with right OIH while 39 patients (39%) presented with left OIH. All surgeries were done electively except in 9 patients who presented with irreducible hernia and were operated on as an emergency (Table 2). Patients who developed contralateral hernias were 7 (7%) five (9) of them presented initially with left side inguinal hernia and (2) of them presented with right side hernia and all of them below 1 year old. The age at initial herniotomy for those patients ranged from 1 month to 10 months and the time interval between the initial surgery and the appearance of contralateral

<table>
<thead>
<tr>
<th>Side</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right (n = 61)</td>
<td>2</td>
<td>59</td>
</tr>
<tr>
<td>Left (n = 39)</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>Age</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1-12 months (n = 55)</td>
<td>7</td>
<td>48</td>
</tr>
<tr>
<td>12-24 months (n = 45)</td>
<td>0</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 1: Distribution of patients according to sex, side of hernia and age (Total number of patients is 317).

Table 2: Distribution of the study group according to side of hernia, age and development of contralateral hernia.

Figure 1: Distribution of male patients younger than 2 years.
hernia ranged from 2 weeks to 5 months and none of them had any complications on the second presentation. One of the two patients presented with irreducible OIH had an irreducible contralateral hernia only 4 weeks after initial operation. The total hospital cost for all patients of the study group including the cost of patients returned with contralateral hernia is estimated and found to be less than the cost if those patients were offered contralateral inguinal exploration.

**Discussion**

Inguinal herniotomy is one of the most common surgical procedures performed by pediatric surgeons due to the high incidence of congenital inguinal hernia in infants and children. Few topics in pediatric surgery have drawn as much attention or generated more controversy than the management of the contralateral side in children presenting with a unilateral hernia. The issue of routine contralateral inguinal exploration in patients presented with unilateral congenital inguinal hernia is the point of debate between pediatric surgeons since 1955 when Rothenberg and Barnett reported that in children with inguinal hernias, (100%) of those younger than 1 year and (68.5%) of those older than 1 year had bilateral hernias till now. Most inguinal hernias in infants and children are indirect inguinal hernias due to a patent processus vaginalis. The PPV is a potential factor for IH development, but is not a true hernia. The practice of pediatric surgeons concerning routine contralateral inguinal exploration in children with unilateral congenital inguinal hernias varied widely along the last 50 years since the report published by Rothenberg and Barnett in 1955 with a trend shifting away from performing routine contralateral exploration. This is clearly noticed in the results published in many surveys of pediatric surgeons. In a 1981 survey of pediatric surgeons, Rowe and Marchildon found that 80% of surgeons routinely performed contralateral exploration in boys, and 90% did so in girls younger than 1 year [2]. As inguinal hernia is a very common condition and herniotomy is the most common operation performed by pediatric surgeons, a large number of children are still being exposed to a potentially unnecessary risk [3]. In order to justify surgery for a CPPV, one must take into account any possible complications that may be sustained after a procedure that may not be necessary. Standard open hernia repair is not without potential complications. The incidences of postoperative reduction in testicular size or frank atrophy in boys may be as high as 3 and 2%, respectively. Other complications including damage to the vas deferens and a postoperative high-riding testis have been reported even after a negative exploration. A single institution study by Tiryaki et al. [4] evaluated 1131 inguinal hernias in 1000 consecutive patients presenting over 6 years. Thirty-eight complications were recorded in 35 patients including wound infection (1.9%) recurrence (0.9%), tethered testis (0.3%), bladder injury (0.3%), vas deferens injury (0.2%) and iatrogenic orchietomy (0.1%). Sigmund et al. [5] reported a single surgeon’s 35-year experience on a large series of 6361 patients, they reported (1.2%) recurrence rate, iatrogenic undescended testis (0.5%), (0.06%) vas deferens injury, (1.2%) wound infection, and (0.3%) testicular atrophy. These relatively low complication rates do not appear to outweigh the potential benefits of avoiding a second operation in up to thirty percent (30%) of children presenting with hernia. Clearly, however, finding a safer, less invasive method for operation in up to thirty percent (30%) of children presenting with irreducible OIH while 39 patients (39%) presented with left OIH. Seven patients (7%) developed MCIH during one year of follow up, 5 of them presented initially with left OIH showing an increased risk of MCIH development in those patients. Patients who developed MCIH did that within a period ranged from 2 weeks to 5 months of follow up and all of them were younger than 1 year old during initial herniotomy. As the patent processus vaginalis is a potential factor of developing an inguinal hernia which may develop at any age due to patent processus vaginalis so, the risk of developing inguinal hernia is theoretically lifelong. Therefore, Frederick suggested a lifelong follow up for correct detection of the risk of development of contralateral inguinal hernia because an indirect inguinal hernia may develop at any age [1]. Although the sample size of patients in this study is small and also the length of follow-up is relatively short but the results observed are not so far from those reported in the vast majority of different studies. Sigmund et al. [5] noticed in their study that more than half (57%) of these contralateral hernias appeared within 1 year of the original hernia repair, 95% by 5 years, and 100% by 10 years. Ron et al. [3] assessed the risk factors of developing MCIH in children and showed that MCIH in 90% will develop within 7 years from the initial repair. This study was placed into six groups depending on the minimum length of follow - up: more than 1 year, more than 2 years, more than 3 years, more than 5 years, more than 10 years and more than 25 years. As the groups overlapped, it was not possible to compare the rates statistically. However, it appears that there is a trend towards a higher rate of MCIH as the minimum length of follow up after hernia repair increases, up to a peak rate of 14.7% at 10 years after the initial hernia repair. There also appears to be only a small increase in the rate of MCIH [3]. We observed in this study that none of patients who developed MCIH had a complication except one patient who presented with an irreducible right inguinal hernia after he presented by irreducible left inguinal hernia 2 weeks earlier but the hernia was reduced and herniotomy was done electively 14 hrs later. Kevin and Timothy reported a low complication rate in patients who developed MCIHs. In some reports complication rate is 0.5% [4]. In this study we found that the majority of parental concern was about anesthesia and the effect of surgery on the testis and the future fertility of their kids but finally they left the decision to the surgeon. From the economic point of view, we found that routine contralateral exploration increases the total cost. So, the total cost is smaller in case of operating the presenting side only even after addition of the cost of those patients who returned with MCIH.

**Conclusion**

From the results of this study and other studies in addition to data in literature, we found that routine CIE is not justified in full term males below 2 years of age presenting with unilateral OIH except in some conditions. Laparoscopy may play a role in solving this debate if facilities, equipment’s, and well trained personnel with a good learning curve are available.

**References**


