Journal of Pediatric Surgery (2005) **40**, 1009–1014

ELSEVIER

Journal of Pediatric Surgery

www.elsevier.com/locate/jpedsurg

American Academy of Pediatrics Section on Surgery hernia survey revisited

Mara B. Antonoff*, **Nathaniel S. Kreykes**, **Daniel A. Saltzman**, **Robert D. Acton**

Division of Pediatric Surgery, University of Minnesota, Minneapolis, MN 55455, USA

Index words:
Inguinal hernia;
Infant;
Laparoscopy;
Surgery;
Postoperative pain;
Anemia;
Hydrocele;
Contralateral;
Questionnaires

Abstract

Background: The aim of the study was to describe current treatment and trends in surgical management of pediatric inguinal hernias (IHs), specifically contralateral exploration.

Methods: Surveys were sent to 599 Surgical Section members. Questions paralleled the 1993 American Academy of Pediatrics survey and addressed recent controversial topics. Statistical analysis by χ^2 was performed.

Results: Three hundred ninety-five (66%) surveys returned. For full-term boys with reducible IH, 79% (*82%*) repair electively, regardless of age or weight. For full-term girls with reducible ovary, 49% (*27%*) repair electively, 36% (59%) next available slot, 5% (*10%*) emergently ($P < .01$). In former premature infants, 53% (65%) repair reducible IH when convenient, regardless of age. For unilaterally presenting IH, 44% (*65%*) routinely explore contralateral groins in boys 2 years or younger ($P < .01$); 47% (*84%*) routinely explore girls 4 years or younger ($P < .01$). No significant association between routine exploration patterns and years in practice, region of country, or training program affiliation was found. Laparoscopic evaluation for contralateral IH was reported by 37% (*6%*), ($P < .01$) 1993 results italicized.

Conclusion: Reports of routine contralateral inguinal exploration had absolute decreases of 21% for boys 2 years or younger, 37% for girls 4 years or younger. There has been a shift toward elective repair for girls with reducible ovaries. Use of laparoscopy for diagnostic contralateral evaluation has increased dramatically.

In 1993, Wiener et al [1] surveyed the Section on Surgery of the American Academy of Pediatrics to assess decision patterns with regard to infants and small children presenting with unilateral IHs. In the 10 years since that survey was conducted, numerous articles have been published questioning the need for routine contralateral inguinal exploration. The objective of this study was to describe the current treatment practices of pediatric surgeons in the management of unilaterally presenting IHs as well as the ways that these treatment patterns have changed over the last decade. In particular, this study aimed to evaluate the relative proportion of surgeons who perform routine contralateral exploration, the techniques that are being used to do so, and the reasons identified by those surgeons who opt against routine contralateral inguinal exploration.

1. Materials and methods

In November 2003, a 32-question multiple-choice survey was sent to all registered members of the Section on

Presented at the 56th Annual Meeting of the Section on Surgery of the American Academy of Pediatrics, San Francisco, California, October 8-10, 2004.

* Corresponding author. Tel.: +1 612 626 4214; fax: +1 612 624 6969.
E-mail address: rose0437@umn.edu (M.B. Antonoff).

0022-3468/$ – see front matter © 2005 Elsevier Inc. All rights reserved.
doi:10.1016/j.jpedsurg.2005.03.018

Surgery; institutional review board approval was obtained. Questions paralleled those that comprised the 1993 survey. Additional questions were included to expand on issues from more recent publications and to incorporate questions pertaining to potential practice changes over the 10 years between the execution of the 2 surveys.

Responses were received by 395 of 599 members, representing 66% of the organization. Replies that were received from individuals or their representatives indicating that they were retired, deceased, or practicing in a field other than general pediatric surgery were not included. Respondent replies were tabulated on a computer database. Comments and answers marked as "other" were individually read and analyzed. Where possible, results were compared with those of the 1993 survey which had a response rate of 50%. χ^2 Testing was applied to assess differences between the surveys, with $P < .01$ accepted as significant. The survey included 5 demographic questions, the results of which were cross-analyzed with the results of the questions pertaining to contralateral exploration.

2. Results

2.1. Full-term infants

In healthy, full-term, infant boys with asymptomatic reducible IHs, 79% of respondents repair electively, as was similarly indicated by 82% in 1993; 6% of respondents wait to operate until patients achieve 10 weeks of age, 10 lb, and hemoglobin of 10 mg/dL. Another 3% wait for infants to reach a set postconception age, anywhere from 44 to 60 weeks, with the average being 50.5 weeks.

In full-term healthy girls with reducible ovaries palpable in the groin, 49% of respondents indicated that they repair electively, 36% at the next available opportunity, and 5% urgently or emergently. These numbers in 1993 were, respectively, 27%, 59%, and 10%. These differences were significant with $P < .001$. For full-term infant girls with nonreducible but asymptomatic ovaries palpable in the groin, 50% indicated that they operate at the next available time slot, whereas 32% operate urgently or emergently. In 1993, the results were 42% and 44%, respectively, $P < .01$.

2.2. Former preterm infants

In the repair of reducible hernias found in former premature infants already discharged from the neonatal intensive care unit (NICU), 53% operate when convenient, regardless of age. In 1993, 65% shared this answer; the difference was not significant. For this scenario, 27% replied that they would repair the infant's hernia at a set postconception age, with a range of 38 to 60 weeks, the average equal to 53.1 weeks. Another 6% indicated that they would operate emergently or urgently.

In former preterm infants born at 29 weeks postconception, weight of 1000 g, 63% of respondents repair reducible hernias before discharge from the NICU; 10% and 8%, respectively, operate at 50 weeks postconception/3.0 kg and 60 weeks postconception/3.5 kg; 5% repair when convenient, regardless of postconception age or weight. Given this scenario in 1993, 71% performed repair before NICU discharge, and 20% waited for postconception age of 49 weeks and weight of 3.5 kg.

With regard to anesthetics in former preterm infants, 33% of respondents prefer general anesthesia alone, 31% prefer general with caudal block, and 15% prefer general with local block. Altogether, 79% use a form of general anesthesia, whereas 13% prefer spinal block, and 6% use caudal block under sedation. This did not differ significantly from the 1993 survey, in which 70% used general anesthetic; 15%, spinal anesthesia; and 11%, caudal block with sedation.

For outpatient (same-day) repair of reducible IH in former premature infants, 34% of respondents repair when convenient, regardless of age; 25% and 19% wait until 50 and 60 weeks postconception, respectively. In 1993, 36% indicated that they waited for 50 weeks postconception, and 33% waited for 60 weeks.

Forty-two percent of respondents would never use a freestanding surgicenter for repair of reducible IH in former preterm infants. Others replied that they would use the freestanding surgicenter if the infant reached a set postconception age, 22% indicating 60 weeks as the marker and 13% indicating 50 weeks. Three percent replied that this option is not available to them. Only 2% would be willing to use a freestanding surgicenter without restriction in the repair of a reducible IH in a former preterm infant. In 1993, 50% of respondents would never have used a freestanding surgicenter, whereas 37% would use one if the infant was older than 60 weeks postconception; this difference was not significant.

Participants were next asked when they would perform an orchiopexy in a former preterm infant with a reducible IH and a contralateral undescended testis. Fifty percent would wait until the infant reached 1 year of age to do the orchiopexy; 15% would do it at 6 months. Eighteen percent would correct the undescended testis concurrently with the repair of the hernia.

For reducible IHs in former preterm infants, 49% of respondents denied that they would readily delay repair for coexisting medical conditions. Thirty-seven percent delay repair for concurrent bronchopulmonary dysplasia with an oxygen requirement, 32% for apnea/bradycardia episodes on home monitors, 15% for well-managed cardiac disease, and 5% for gastroesophageal reflux disease. For comparison, in the 1993 survey, these numbers were 28%, 24%, 19%, and 17%, respectively, and 12% delayed for other medical conditions.

2.3. Contralateral exploration

In male children with unilaterally presenting IH, respondents had varying answers as to when they would