Sutureless Laparoscopic Inguinal Hernia Repair in Children – Don’t Risk Injury with Sutures

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To cite this article:

Received: September 22, 2020; Accepted: October 6, 2020; Published: October 13, 2020

Abstract: Introduction: There have been multiple descriptions for the laparoscopic repair of inguinal hernia in children. Except for one, they all involve a suture ligation of the internal ring. Our concern is that suture ligation of the internal ring can injure the vas deferens, gonadal vessels, or cause unnecessary bleeding. We report the results of our laparoscopic inguinal hernia repairs, where we incise the peritoneum of the internal ring, and dissect the tunica vaginalis for 1 cm. We do not suture ligate the internal ring. This includes patients who underwent laparoscopic evaluation and treatment for intraabdominal testicles, and thus have 6 month laparoscopic follow-up of those patients having a staged orchiopexy. Study design: We reviewed the charts from 2005 to 2016 of all patients with CPT codes 54692 (laparoscopic orchiopexy) and 49650 (laparoscopic inguinal hernia). During laparoscopy for the nonpalpable testicle, we proceeded to either a one stage or 2 stage orchiopexy. When we observed inguinal hernia opening on the contralateral side of the undescended testicle, we repaired it by incising around the internal ring, and carefully excising the tunica vaginalis from the internal ring for a distance of 1 cm, leaving the internal oblique muscle to heal together, and peritoneum to resurface the area, without using sutures. (This is the same as is done for the laparoscopic orchiopexy side). In those patients with a staged orchiopexy, and we reevaluated the hernia sight for closure. Results: We reviewed charts of 87 patients with ages ranging from 3 months to 10 years. Eighteen of these had bilateral laparoscopic orchiopexy, 38 had left, and 24 had right. We performed 21 bilateral laparoscopic hernia repairs, 27 had left only, and 18 had right only. Of those patients with hernias, 11 hernias were found on the side opposite an undescended testis. In 4 patients we had the opportunity to perform a second stage orchiopexy six months later and observed the inguinal ring had closed. Follow up was at least 6 months for all patients, and no clinical hernias resulted. Conclusion: Laparoscopic inguinal hernia repair in children can be successfully and safely performed by excising the hernia sac (patent processus vaginalis) from the inguinal canal, and does not require suture ligation of the internal ring.

Keywords: Laparoscopic Inguinal Hernia, Laparoscopic Orchiopexy, Pediatric

1. Introduction

Inguinal hernias occur in approximately 1 out of every 100 boys. They can occur on the contralateral side in approximately 20% of boys under the age of two. An undescended testicle usually has a hernia associated with it, especially if it’s an intra-abdominal testicle. During a laparoscopic orchiopexy for correction of the intra-abdominal testicle, one may find a long-looped vas that courses with a patent processus vaginalis through an open internal ring and down toward the scrotal area. The open internal ring is considered an inguinal hernia, as if left alone will become clinically apparent as the child grows and develops increasing abdominal pressure. During a standard laparoscopic orchiopexy, the peritoneum is released from the patent processus vaginalis at the internal ring. By incising the peritoneum around the internal ring, the testicle is brought down, either through the internal ring, or medial to the epigastric vessels. The peritoneum is not typically closed at the internal ring, and persistent clinical hernias are rare [1, 2]. Occasionally during the procedure, a hernia is noted at the
inguinal ring contralateral to that of the abdominal testicle. If
the orchiopexy is done as a two stage procedure, one can fix
a contralateral hernia at the first laparoscopy, and verify it is
closed at the second laparoscopy 6 months later.

In a standard open pediatric inguinal hernia repair, one
suture ligates the hernia sac at the internal ring, and the
internal ring musculature is not reinforced. There have been
many laparoscopic pediatric inguinal hernia repair
procedures described, [3] and in all but two papers, they
involve a suture ligation of the internal ring. [4] Our concern
is that suture ligation of the internal ring can injure the vas
deferens or gonadal vessels, or cause unnecessary bleeding.
We describe a repair using a sutureless repair of the internal
ring for pediatric inguinal hernia of the contralateral side, and
we provide follow-up visual documentation of a closed
internal ring in a subset of patients who have undergone a
two-stage Fowler Stephens repair.

2. Methods

We reviewed the charts from 2005 to 2016 of all patients
with CPT codes 54692 (laparoscopic orchiopexy) or 49650
(laparoscopic inguinal hernia). Patients included were those
requiring a laparoscopic orchiopexy with findings of an
inguinal hernia on the contralateral side. For the nonpalpable
testicle, we performed either a one stage or two stage
laparoscopic orchiopexy. As part of the orchiopexy, a
peritoneal incision was carried around the internal ring,
freeing the peritoneal tissue off the gonadal vessels and vas.
When we observed an inguinal hernia opening on the
contralateral side from the undescended testicle, we repaired
it by incising around the internal ring, and carefully excising
the tunica vaginalis from the internal ring for a distance of 1
cm, leaving the internal oblique muscle to adhere during the
healing process and to allow the peritoneum to resurface the
area. Sutures were avoided with this technique. In those
patients with a staged orchiopexy, we reevaluated the hernia
sight for closure at the 6 month second stage procedure. All
patients had follow up of at least 6 months to check for
clinical evidence of hernia.

3. Results

We reviewed charts of 87 patients with ages ranging from
3 months to 10 years who underwent laparoscopic
orchiopexy. Of these, 18 underwent bilateral laparoscopic
orchiopexy, 38 had left, and 24 had right intraabdominal
testicles. We performed twenty-one bilateral laparoscopic
hernia repairs and 46 unilateral repairs (27 left, 18 right).
Some patients with an intraabdominal testicle did not have a
hernia on the affected side, and some patients with a vanished
testis or laparoscopic varicocele had a hernia on the
contralateral side. Of those patients with hernias, 11 hernias
were found on the side opposite an undescended testis. None
of our patients had an inguinal defect greater than 1 cm. Four
patients underwent a 2nd stage orchiopexy 6 months after the
first stage, where we confirmed laparoscopically that the
inguinal opening had closed after repair. (Figures 1-5) Follow
up was at least 6 months for all patients. There were no
instances of clinically significant hernias, no development of
hydroceles and no testicular atrophy.

4. Discussion

The incidence of the pediatric inguinal is 1%, and during
repair, about 20- 40%of patients under age two will have a
patent process vaginalis on the contralateral side to the clinically
apparent side. [5] About 25% of these with contralateral patent
processus vaginalis, if left alone, will become clinically apparent
over time. [3, 6] Palmer described looking at the contralateral
ring during laparoscopic orchiopexy, and found about a 9% incidence of hernia. [1] The hernias were repaired with a suture
technique, and there was no evidence of hernia at 4 months
postop. Our method of laparoscopic inguinal hernia resection
involves incision around the peritoneum and careful dissection
of the patent processes vaginalis from the inguinal canal for
about a length of 1 cm. We do not suture the internal ring. We
have four boys with postop pictures from six months later. We
had no recurrences.

Most described laparoscopic repairs of the hernia include
an intra- or extraperitoneal suture technique. Recently,
Davies et al for the International Pediatric Endosurgery
Group reviewed the literature on the safety and efficacy of
laparoscopic hernia repair, comparing it to open inguinal
hernia repair, and found the for bilateral hernias, laparoscopic
repair is more facile and quicker while having no increase in
recurrence rate. [3] There have been a number of published
papers using suture to close the internal ring, without
resection of the peritoneum at the internal ring. [7-11] Some
have questioned whether it is important to resect some of the
peritoneum, while still using suture to close the internal ring
muscle. [12] Pant compared resection of the peritoneal ring
versus resection of the peritoneal ring with suture, and found
that suturing made no difference unless the hernia opening
was greater than 10 mm, in which case they had three
recurrences, (two in nonsuture group, and one in the suture
group). [13] Riquelme found complete success during
laparoscopy when he resected the tunica vaginalis from the
inguinal canal and did not suture the peritoneum, unless the
internal ring was greater than 10 mm. They had no
recurrences. [4] Weaver et al and Centeno-Wolf et al have
determined that leaving a patent processus vaginalis opening
results in a clinical problem in 10-15% of patients if left open
[14, 15] The complications from hernia repair include
atrophic testis, hydrocele formation, re-assent of the testis,
and recurrence. [3] Infection rate is minimal. Most recurrence
rates occur in patients with larger hernia defects. In our small
series of laparoscopic hernia repair, we had no recurrences,
no infections, and no testis atrophy. We did not use sutures
after resection of the internal ring peritoneum, but would
have considered using them if the opening was greater than
10 mm.
5. Conclusion

Patent processus vaginalis, when left untreated, has an unknown true risk of developing into a clinical hernia. Using suture to close the defect is not necessary unless it is a defect over 10 mm. Laparoscopic inguinal hernia repair in children can be successfully, and safely performed by excising the hernia sac (patent processus vaginalis) from the inguinal canal and does not require suture ligation of the internal ring. This can prevent inadvertent injury to the gonadal vessels or vas deferens during suture placement.

Acknowledgements

The authors would like to thank J. Duncan Phillips, MD, Chief of Pediatric Surgery at Wake Med Hospital, Raleigh USA for his review and suggestions for the manuscript.

References


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