The Effect of Resident Involvement on Surgical Outcomes for Common Urologic Procedures: A Case Study of Uni- and Bilateral Hydrocele Repair

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OBJECTIVE Previous studies have investigated the effect of resident involvement (RI) on surgical complications in minimally invasive and complex surgical cases. This study evaluates the effect of surgical education on outcomes in a simple general urologic procedure, unilateral and bilateral hydrocele repair, in a large prospectively collected multi-institutional database.

METHODS Relying on the American College of Surgeons National Surgical Quality Improvement Program Participant User files (2005-2013), we extracted patients who underwent unilateral or bilateral hydrocele repair using Current Procedural Terminology codes 55040, 55041, and 55060. Cases with missing information on RI were excluded. Descriptive and logistic regression analyses were performed to assess the impact of RI on perioperative outcomes. A prolonged operative time (pOT) was defined as operative time >75th percentile.

RESULTS Overall, 1378 cases were available for final analyses. The overall complication, readmission, and reoperation rates were 2.3% (32/1378), 0.5% (7/1378), and 1.4% (19/1378), respectively. A pOT was more frequently observed in bilateral procedures (35.2% vs 21.3%, $P < .0001$) and with RI (33.8% vs 19.0%, $P < .0001$). Procedures with RI had a 2.2-fold higher odds of pOT (95% confidence interval 1.7-2.8, $P < .0001$). Overall complications (odds ratio 1.1, 95% confidence interval 0.5-2.3) were not associated with RI ($P = .789$). In sensitivity analyses, all postgraduate years of training were associated with a pOT ($P < .0001$).

CONCLUSION Although the involvement of a resident in hydrocele repairs leads to higher odds of pOT, it does not affect patient safety, as evidenced by similar complication rates. UROLOGY 94: 70–76, 2016.

In an era of cost containment, quality measures, increased liability risk,[1] and patient safety concerns, resident involvement (RI) in surgeries has come under increasing scrutiny.[2,3] Whereas much of the literature focuses on complex procedures[4] or minimally invasive procedures[5,6] that may have a steep learning curve for residents, there is little data on the effect of RI in simple open surgical cases. However, in the latter kind of cases, residents are more likely to do a significant portion of these cases and are more likely to have more autonomy during the case. In the urologic setting, a hydrocelectomy is one frequently encountered general case. A hydrocele is a free-fluid collection between the visceral and parietal layers of the tunica vaginalis, and is the most common cause for benign scrotal enlargement.[7] It affects 1% of adult men over the age of 40,[8] and occurs bilaterally in about 7%-10% of cases.[9] The most common underlying causes are an imbalance between production and absorption of serous fluid in the presence of a patent processus vaginalis; an excessive production of serous fluid in infectious testicular diseases; an interference of lymphatic drainage seen in some parasitic diseases; trauma; and testicular cancer.[10] Although most hydroceles are asymptomatic, patients may seek treatment if they become large enough to cause discomfort or for cosmetic reasons. Surgery represents the gold standard for definitive management of hydroceles,[11,12] and a hydrocele repair is a basic common procedure taught in resident training. Typical complications include hematoma, infection, and persistent swelling.

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Given the high standard for cost containment and optimal outcomes in health care, specifically surgical outcomes, we sought to evaluate RI in a simpler procedure, unilateral and bilateral hydrocele repair, and to assess the impact of RI on complication rates and perioperative outcomes using a large national sample.

METHODS

Population Source

This study is based on the National Surgical Quality Improvement Program (NSQIP) database, which is a prospective initiative by the American College of Surgeons that collects risk-adjusted data to facilitate the measurement of outcome measures after surgery.[13,14] A dedicated surgical reviewer collects the NSQIP data. These validated data sets from patients' medical records allow quantification of 30-day risk-adjusted surgical and medical complications. In 2013, the NSQIP participant user file includes data from 2,972,860 cases from 435 participating sites.

Study Population

An institutional review board waiver was obtained from the Brigham and Women's Hospital in accordance with institutional policy when dealing with de-identified administrative data. Cases with unilateral and bilateral hydrocele repair between January 1, 2006 and December 31, 2013 were identified using Current Procedural Terminology codes (55040, 55041, and 55060). Any cases with missing information on RI were excluded.

Covariates

For all patients, age, race, smoking status, body mass index (BMI), American Society of Anesthesiologists physical status, and type of surgery (unilateral vs bilateral) were extracted. RI was stratified into two categories: attending alone vs RI.

Outcomes

The primary end point was any intraoperative or postoperative complication. Complications were categorized as follows: intra- or postoperative blood transfusions, wound complications (superficial, deep, and organ space surgical site infection as well as wound dehiscence), cardiovascular (postoperative cardiac arrest, myocardial infarction, or cerebrovascular accident), pulmonary (pneumonia, need for prolonged postoperative ventilation or reintubation), thromboembolic (deep venous thrombosis and pulmonary embolism), sepsis and septic shock, renal (acute renal failure and progressive renal insufficiency), and urinary tract infection. These were subsequently summarized into a composite variable for multivariable analysis. Secondary outcomes consisted of prolonged length of stay (pLOS), defined as inpatient stay ≥2 days, and prolonged operative time (pOT), defined as the >75th percentile (>53 minutes). Finally, 30-day readmission data were reported for procedures beginning January 2012.

Statistical Analyses

Descriptive statistics of categorical variables focused on frequencies and proportions. Means, medians, and interquartile ranges (IQRs) were reported for continuously coded variables, as appropriate. The chi-square test and Mann-Whitney *U* test were used to compare proportions and medians, as appropriate. Subsequently, multivariable logistic regression models tested the association between preoperative covariates and the aforementioned outcomes. Covariates consisted of age, BMI, laterality, and RI. Subanalyses with RI stratified according to postgraduate year (PGY) (junior [PGY 1-2], senior [PGY 3-4], or chief [PGY 5]) were also performed. All statistical tests were performed using SPSS (version 23, IBM, Armonk, NY) with a 2-sided significance level set at $P < .05$.

RESULTS

Descriptive Analyses

After excluding cases without information on RI, a final study population of 1378 cases remained for analysis (81.9% [1128/1378] unilateral and 18.1% [250/1378] bilateral). A comparison of the cases with missing information on RI to those with information on RI showed no differences concerning preoperative, intraoperative, and postoperative variables (data not shown). Descriptive characteristics and outcomes stratified according to unilateral vs bilateral hydroceles are shown in Table 1. Median patient age (IQR) was 58 (48, 68) years. A higher proportion of patients with bilateral hydroceles were older ($P = .047$). Median BMI was 28.2 (IQR 25.1-32.6), and 38.7% (533/1378) of patients were obese (defined as BMI >30). Bilateral hydrocele was more common in obese patients ($P = .001$).

Descriptive characteristics and outcomes stratified according to RI are shown in Table 2. Residents took part in 31.4% (433/1378) of the cases and RI did not differ between unilateral and bilateral procedures ($P = .924$). The PGY status of the residents were as follows: 29.8% (129/433) for PGY1-2, 47.8% (207/433) for PGY3-4, and 22.4% (97/433) for PGY5. Patient characteristics did not differ between resident and attending-only cases, except for race, with residents performing more procedures on non-White patients (18.7% vs 10.9%, $P < .001$).

Outcomes

The overall complication rate was 2.3% (32/1378), with wound complications being the most common in 1.6% (23/1378) of cases. Overall readmission and reoperation rates were 0.5% (7/1378) and 1.4% (19/1378), respectively. There was no difference in complications with regard to unilateral vs bilateral approach and RI ($P > .05$, respectively) (Table 2).

Although pLOS occurred more often in bilateral procedures (2.8% vs 1.2%, $P = .049$), RI did not play a role ($P = .973$). A pOT was observed more often in bilateral procedures (35.2% vs 21.3%, $P < .0001$). Cases with RI were significantly prolonged in both unilateral and bilateral cases ($P < .0001$, respectively; Table 2).

Table 1. Baseline patient characteristics and outcomes as a function of uni- vs. bilateral hydrocele repair, as drawn from the National Surgical Quality Improvement Program Participant User Files from 2006 to 2013

	All (n = 1378)		
Variables	Unilateral (n = 1128)	Bilateral (n = 250)	P*
Age	58 (47, 68)	61 (50, 69)	.047
Race (%)			
White	739 (65.5)	184 (73.6)	.003
Non-White	116 (10.3)	30 (12.0)	
Unknown	273 (24.2)	36 (14.4)	
BMI (%)			
<18	26 (2.3)	5 (2.0)	.001
18-25	263 (23.3)	30 (12.0)	
25-30	408 (36.2)	102 (40.8)	
>30	420 (37.2)	113 (45.2)	
Unknown	11 (1.0)	0 (0)	
ASA (%)			
<3	770 (68.3)	176 (70.4)	.488
>3	353 (31.3)	74 (29.6)	
Unknown	5 (0.4)	0 (0)	
Active smoker (%)	215 (19.1)	47 (18.8)	.924
Hypertension (%)	495 (43.9)	144 (57.6)	<.0001
Diabetes (%)	145 (12.9)	41 (16.4)	.138
Cardiopulmonary comorbidity (%)	171 (15.2)	51 (20.4)	.044
Cerebrovascular comorbidity (%)	50 (4.5)	17 (6.8)	.120
Other comorbidity (%)	17 (1.5)	6 (2.4)	.323
Resident involvement	369 (32.7)	81 (32.4)	.924
Outpatient procedure (%)	1082 (95.9)	240 (96.0)	.955
Cardiovascular complications (%)†	0 (0)	0 (0)	-
Pulmonary complications (%)†	2 (0.2)	0 (0)	.505
DVT or pulmonary thromboembolic complications (%)†	1 (0.1)	0 (0)	.638
Sepsis and/or septic shock (%)†	2 (0.2)	0 (0)	.505
Renal failure (%)†	0 (0)	0 (0)	-
UTI complications (%)†	6 (0.5)	0 (0)	.248
Wound complications (%)†	16 (1.4)	7 (2.8)	.123
Bleeding complications (%)†	1 (0.1)	0 (0.0)	.638
Overall complications (%)†	25 (2.2)	7 (2.8)	.579
Reoperation (%)†	16 (1.4)	3 (1.2)	.789
Readmission (%)†‡	6 (3.6)	1 (2.3)	.671
pLOS (%)§	13 (1.2)	7 (2.8)	.049
pOT (%)¶	240 (21.3)	88 (35.2)	<.0001

ASA, American Society of Anesthesiologists; BMI, body mass index; DVT, deep venous thrombosis; pLOS, prolonged length of stay; pOT, prolonged operative time; UTI, urinary tract infection.

* Mann-Whitney *U* test or chi-square test as appropriate.

† Thirty-day complications.

‡ As of 2011.

§ Defined as ≥2 days.

¶ Defined as ≥75th quartile.

Multivariable Analyses

A procedure involving a resident had a 2.2-fold higher likelihood of a pOT (95% confidence interval [CI] 1.7-2.8) than attending-alone cases ($P < .0001$). RI had no significant association with a pLOS (odds ratio [OR] 0.7, 95% CI 0.3-1.9, $P = .463$) or overall complications (OR 1.1, 95% CI 0.5-2.3, $P < .0001$). In subgroup analyses by PGYs of training, all categories of resident training were associated with a pOT ($P < .0001$, Table 4). RI or PGY category was not associated with pLOS or overall complications ($P > .05$, Tables 3 and 4). Other variables predicting pOT were BMI (OR 1.0, 95% CI 1.0-1.0, $P < .0001$) and a bilateral procedure with a 1.9-fold increased odds of a pOT (95% CI 1.4-2.7, $P < .0001$). A pLOS was not associated with age, BMI, laterality, or RI ($P > .05$) Overall complications were predicted by increasing BMI (OR 1.1, 95% CI 1.0-1.1, $P = .009$). In the PGY category, multivariable model BMI was associated with pOT and overall complications (OR 1.0, 95% CI 1.0-1.0, $P = .009$, and OR 1.1, 95% CI 1.0-1.1, $P = .006$, respectively). Laterality was associated with pOT in this model as well (OR 1.9, 95% CI 1.4-2.7, $P < .0001$).

DISCUSSION

RI in surgical procedures has come under heavy scrutiny due to the focus on operative outcomes and quality metrics by accreditation groups and healthcare reforms. Additionally,

Table 2. Baseline patient characteristics and univariable predictors of outcomes as a function of resident involvement in hydrocele repair, as drawn from the National Surgical Quality Improvement Program Participant User Files from 2006 to 2013

	All (n = 1378)			Unilateral (n = 1128)			Bilateral (n = 250)		
Variables	Resident n (%), median (IQR)	Attendant n (%), median (IQR)	*P**	Resident n (%), median (IQR)	Attendant n (%), median (IQR)	*P**	Resident n (%), median (IQR)	Attendant n (%), median (IQR)	*P**
	450 (32.7)	928 (67.3)		369 (32.7)	759 (67.3)		81 (32.4)	169 (67.6)	
Age	57 (47, 68)	59 (48, 68)	.578	58 (48, 68)	58 (48, 68)	.498	58 (48, 68)	59 (49, 68)	.828
Race (%)									
White	270 (81.3)	638 (89.1)	.001	215 (81.7)	511 (89.0)	.004	55 (79.7)	127 (89.4)	.057
Non-White	62 (18.7)	78 (10.9)		48 (18.3)	63 (11.0)		14 (20.3)	15 (10.6)	
BMI (%)									
<25	73 (22.0)	155 (21.6)	.981	66 (25.1)	132 (23.0)	.774	7 (10.1)	23 (16.2)	.490
25-30	119 (35.8)	261 (36.5)		90 (34.2)	207 (36.1)		29 (42.0)	54 (38.0)	
>30	140 (42.2)	300 (41.9)		107 (40.7)	235 (40.9)		33 (47.8)	65 (45.8)	
ASA ≥3 (%)	111 (33.5)	247 (34.6)	.726	92 (35.1)	201 (35.2)	.981	19 (27.5)	46 (32.4)	.473
Smoking (%)	67 (20.2)	130 (18.2)	.535	52 (19.8)	106 (18.5)	.654	15 (21.7)	24 (16.9)	.396
Cardiovascular complications (%)†	1 (0.3)	0 (0)	.142	1 (0.4)	0 (0)	.139	0 (0)	0 (0)	n.a.
Pulmonary complications (%)†	1 (0.3)	1 (0.1)	.577	1 (0.4)	1 (0.2)	.571	0 (0)	0 (0)	n.a.
DVT (%)†	0 (0)	1 (0.1)	.496	0 (0)	1 (0.2)	.498	0 (0)	0 (0)	n.a.
Sepsis and/or septic shock (%)†	1 (0.3)	1 (0.1)	.577	1 (0.4)	1 (0.2)	.571	0 (0)	0 (0)	n.a.
Renal failure (%)†	0 (0)	0 (0)	n.a.	0 (0)	0 (0)	n.a.	0 (0)	0 (0)	n.a.
UTI complications (%)†	1 (0.3)	4 (0.6)	.574	1 (0.4)	4 (0.7)	.581	0 (0)	0 (0)	n.a.
Wound complications (%)†	5 (1.5)	7 (1.0)	.454	4 (1.5)	4 (0.7)	.255	1 (1.4)	3 (2.1)	.740
Bleeding complications (%)†	0 (0)	1 (0.1)	.496	0 (0)	1 (0.2)	.498	0 (0)	0 (0)	n.a.
Overall complications (%)†	8 (2.4)	13 (1.8)	.523	7 (2.7)	10 (1.7)	.381	1 (1.4)	3 (2.1)	.740
Reoperation (%)†	0 (0)	4 (0.6)	.172	0 (0)	4 (0.7)	.175	0 (0)	0 (0)	n.a.
Readmission (%)†	0 (0)	7 (1.0)	.071	0 (0)	6 (1.0)	.096	0 (0)	1 (0.7)	.485
pLOS (%)‡	4 (1.2)	14 (2.0)	.384	2 (0.8)	10 (1.7)	.267	2 (2.9)	4 (2.8)	.973
pOT (%)§	131 (39.5)	145 (20.3)	<.0001	92 (35.0)	107 (18.6)	<.0001	39 (56.5)	38 (26.8)	<.0001

IQR, interquartile range; other abbreviations as in Table 1.

* Chi-square test or Mann-Whitney *U* test.

† Using 30-day data.

‡ Defined as ≥2 days.

§ Defined as ≥75th quartile.

Table 3. Uni- and multivariable binominal logistic regression analysis on the impact of level of training (attending vs resident; OR [95% CI]) on pOT, pLOS, and overall complications

	Attending only	Univariable Any resident involvement	Multivariable Any resident involvement
pOT	1 (Ref.)	2.2 (1.7-2.8)	2.2 (1.7-2.9)
P value		<.0001	<.0001
pLOS	1 (Ref.)	0.7 (0.2-1.9)	0.7 (0.3-1.9)
P value		.465	.463
Overall complications	1 (Ref.)	1.1 (0.5-2.3)	1.1 (0.5-2.3)
P value		.834	.789

CI, confidence interval; OR, odds ratio; Ref., Reference; other abbreviations as in Table 1.
Multivariable model controlled for age, body mass index, and uni- vs bilateral procedure.

duty hour restrictions of residents have caused concern about adequate resident training,[15,16] subsequently jeopardizing adequate surgical outcomes. Health economics and increasing cost pressure may further compromise resident exposure in surgical procedures. On the basis of these considerations, we sought to evaluate the effect of RI on a simple surgical procedure, as residents may have a more active role compared to previously studied complex or laparoscopic cases.[4-6,17-20]

This study showed that RI in unilateral and bilateral hydrocelectomy was associated with pOT, without compromising perioperative outcomes, including overall complications, readmission, and reoperation rates. The association between RI and pOT are consistent with several other published reports focusing on the importance of RI. Allard et al[20] found a pOT in transurethral resection of bladder tumor and endoscopic treatment of prostate enlargement (OR 2.02, $P < .001$; and OR 2.03, $P < .001$, respectively) when residents were involved. However, they observed an increased length of stay (34.6% vs 28.8% and 37.4% vs 22.7%, $P = .001$ and $P < .001$, respectively) and a higher readmission rate (29.4% vs 21.5% and 20.6% vs 12.9%, $P < .001$) when residents were involved in the procedures, which was discordant with our results. Furthermore, Meyer et al[4] found a similar association between RI and pOT for male 1-stage anterior urethroplasties (OR 2.4, 95% CI 1.3-9.6, $P = .035$). The readmission rate and length of stay were not adversely affected in their analyses. Both aforementioned series did not find a higher incidence of complications when residents were involved in the procedure. The findings of pOT and RI have also been corroborated by another NSQIP-based study, which evaluated laparoscopic and robotic urologic oncology procedures.[5] In this study, Ruhotina et al found pOT when residents were involved, regardless of procedure. However, they analyzed radical prostatectomies, partial nephrectomies, and radical nephrectomies, which are far more complex procedures compared to hydrocelectomies. In a comprehensive report by Matulewicz et al,[17] the authors even suggested a protective effect of RI on overall and surgical complications. In their analysis of all urology cases with RI in the American College of Surgeons-NSQIP, resident participation was associated with decreased odds of overall and medical complications (OR 0.85, 95% CI 0.75-0.94; and OR 0.83, 95% CI 0.75-0.92, respectively) as well as reoperation (OR 0.67, 95% CI 0.57-0.79). Outside the urologic specialty, pOT has also been observed among multiple other surgical procedures[6,18,19] when residents were involved. In a typical teaching procedure for general surgeons, laparoscopic cholecystectomy, Kauvar et al[6] found that RI led to a pOT regardless of attending seniority. In a pooled analysis of 60,711 general surgical procedures in the NSQIP database, Kiran et al[18] found longer operative times in the resident group (122 ± 80 minutes vs 97 ± 67 minutes, $P < .001$). In all of the three previously mentioned series, RI led to higher rates of complications, but only in the report by Kiran et al[18] did the observed differences persist in the multivariable analyses. Again, the analyzed general surgical procedures were more complex than hydrocele repair.

Interestingly, increasing resident experience did not lower operative time in our series. This effect was also observed[4] for 1-stage male urethroplasties and in a series of 6841 ventral hernia repairs.[19] In the latter series, operative time was significantly longer with increasing PGY level: juniors (PGY 1-3) (15.7 minutes, CI 12.2-19.2), chiefs (PGY 4-5) (18.0 minutes, CI 14.7-21.3), and fellows (PGY ≥ 6)

Table 4. Uni- and multivariable binominal regression with subgroup analyses of hydrocele repair according to year of training (attending vs resident postgraduate year [PGY]; OR [95% CI]) and impact on pOT, pLOS, and overall complications

		Univariable			Multivariable		
	Attending only	Junior (PGY 1-2)	Senior (PGY 3-4)	Chief (PGY ≥5)	Junior (PGY 1-2)	Senior (PGY 3-4)	Chief (PGY ≥5)
pOT	1 (Ref.)	2.6 (1.8-3.9)	2.1 (1.5-2.9)	2.2 (1.4-3.5)	2.6 (1.7-3.9)	2.2 (1.6-3.1)	2.3 (1.4-3.6)
P value		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
pLOS	1 (Ref.)	0.6 (0.1-4.3)	1.4 (0.5-4.4)	1.5 (0.3-6.8)	0.5 (0.1-3.9)	1.5 (0.5-4.8)	1.5 (0.3-6.7)
P value		.578	.549	.592	.513	.458	.604
Overall complications	1 (Ref.)	0.7 (0.2-3.2)	1.9 (0.8-4.3)	0.9 (0.2-4.2)	0.7 (0.2-3.0)	2.0 (0.9-4.7)	0.9 (0.2-4.2)
P value		.672	.145	.972	.632	.098	.962

Abbreviations as in Tables 1 and 3.
Multivariable model controlled for age, body mass index, and uni- vs bilateral procedure.

(24.9 minutes, CI 19.1-30.7) had significantly longer cases than attending alone (all $P < .001$). A possible explanation for this finding is that more advanced residents and fellows commonly take more responsibilities in performing key steps of the procedures on their own or could be involved in more complex cases.

Although pOT appears to be the only negative outcome associated with RI, it is important as it may lead to higher costs. Operating room cost is estimated at $62 a minute[21] depending on the method of cost estimation. Given our findings of pOT with RI, it is likely that the training of residents increases costs. Indeed, Babineau et al[22] found that adding a resident to a surgical team added "costs" to the attending because the additional time spent in the operating room restrained the attending from perform other tasks. However, there is evidence that adding a resident to a surgical team allots free time to another senior surgeon, allowing an increase in the overall caseload and substantiating profits[22] or at least limiting financial losses. However, cost concerns might have contributed to the low rates (31.4%) of RI in unilateral or bilateral hydrocele repair in our study.

The overall complication rate in this series was 2.3% (32/1378) and the most common complications were surgical site infections or wound complications (1.6% [23/1378]). The observed complication rate using the NSQIP database is lower than those reported in the literature where complication rates of 0.7%[23] to 70%[24] have been reported. Typical complications of hydrocele repair are hematoma, infection, surgical site infection, persistent swelling, and recurrence.[23] The reported rates of infection and hematoma formation range from 0%[25] to 10%[26] and from 0%[27] to 17%,[26] respectively. In the most recent available piece of evidence, Kiddoo et al[23] reported an overall complication rate of 19.2% (31/161) in patients with hydrocele and spermatocele repair and their most frequent complications were postoperative swelling and infection in 9.3% (15/161) and 9.3% (15/161), respectively.

There are several limitations to our study. Due to the retrospective design, we were not able to control for all known variables, which can introduce an unknown bias. As several different types of hydrocele repair exist, we were not able to adjust for them because they are not specified in the NSQIP database. However, most of the procedures only differ in minor details, which likely would not have an effect on the outcomes. The most significant limitation is that the degree of RI or attending supervision in each case is unknown. The NSQIP database has other inherent limitations: data have been collected over a relatively short time period (2005-2013), participation is voluntary, and not nationally representative. Accordingly, we were unable to assess time trends, which would have added more insight into resident involvement. Also, there were a large number of cases with missing information on resident involvement. A comparison of excluded and included cases did not show statistically significant differences and we assume that cases are missing at random, which may diminish the effect on the results. Finally, patients who are treated at a hospital as an outpatient may not return to the hospital if they develop minor postoperative complications and may go to a primary care physician instead. This could result in an underestimation of specific complications. This is further emphasized by the high prevalence of outpatient procedures in our cohort (95.9%). More research is necessary concerning outcomes of patients who had an outpatient procedure to address the incidence of adverse events in these patients. Additional research focusing on costs in minor surgical procedures with RI should be performed.

CONCLUSION

In conclusion, this study is the first to evaluate the impact of RI in a simple surgical case, unilateral and bilateral hydrocele repair, using a large administrative database. We were able to conclude that RI does not lead to an increased harm for patients. Although longer operative times may increase costs, RI in surgical procedures is necessary for training, and it is reassuring that there is no increased incidence of perioperative complications.

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