International Surgery Journal
Manoharan V et al. Int Surg J. 2023 Jan;10(1):97-104
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20223599

Original Research Article

Occult hernia: role of laparoscopy in detecting the unseen

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Received: 20 November 2022
Revised: 14 December 2022
Accepted: 17 December 2022

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ABSTRACT

Background: Occult hernias (OH) refer to those hernias which are not evident on clinical examination, but which are noted either on surgical exploration or on good quality pre-operative imaging. Identifying them in day-to-day practice is of immense importance in view of unexplained and undiagnosed symptomatology, post-operative recurrences and cost effectiveness. The main objective of this paper is to study the incidence of occult hernias diagnosed intra-operatively during laparoscopic groin hernia surgery.
Methods: In this retrospective study, we identified 723 patients who underwent laparoscopic repair of groin hernia in our institute by a single surgeon, from 2008 to 2021. OH were found in 120 patients, all during totally extraperitoneal approach (TEPA) and none during transabdominal pre-peritoneal approach (TAPP). The age range of these 120 patients was 22 to 83 years (mean: 60.7 years with SD: ±12.5 years). The patients were also analysed for sex, type of OH, side of OH and post-operative outcomes.
Results: Incidence of OH in our study was 16.59% (120 out of 723 patients). OH were found in both male as well as female patients. These comprised of unilateral and bilateral OH. Patients with unilateral OH heavily outnumbered those with bilateral OH (n=117 vs. 3). There were 3 different types of OH in our study-inguinal, femoral and spigelian. The maximum number of cases were of inguinal OH (n=115). Among inguinal OH, patients with direct OH outnumbered those with indirect OH (n=73 vs. 40).
Conclusions: Awareness about OH as an entity is important, as their identification and concurrent repair possibly spares the patient another surgical intervention at a later date.

Keywords: Laparoscopy, Occult Hernia, Total extraperitoneal repair

INTRODUCTION

Occult hernias (OH) are akin to 'hidden hernias' which are clinically significant on two counts: some cause symptoms such as chronic groin pain of unexplained origin, which hampers quality of life and even if they are asymptomatic, awareness about them and their detection during surgery being performed for ipsilateral or contralateral clinically diagnosed herniae, enables the surgeon to concurrently repair them and possibly save the patient another surgery, at a later date. Essentially, OH occur in the groin area. These comprise inguinal (both direct and indirect), femoral, spigelian and obturator herniae. If there is lack of awareness about OH, one is likely to miss them, leading to possible postoperative hernia recurrence or local adverse events, such as chronic pain that negatively impacts the patient's quality of life. In this retrospective study, we describe our experience with detection and management of occult herniae which were incidentally diagnosed while operating laparoscopically, on the clinically discerned and diagnosed herniae; over a 13 year period, from January 2008 to December 2021.

Objectives

The objective of this paper is to study the incidence of OH diagnosed incidentally 'on table', during the

performance of laparoscopic surgical repair of clinically diagnosed groin hernia and to analyze its many sub-types vis-a-vis their laterality and exact location.

METHODS

This is a retrospective analysis and study of prospectively collected data. It took place at the Dr. L. H. Hiranandani hospital, Mumbai, India; from January 2008 to December 2021. All patients who were operated laparoscopically for groin hernia within the study period, were included in this study. Those patients who underwent open groin hernia surgery as well as those who were intra-operatively converted from laparoscopic to open surgery, were excluded from this study. In this retrospective analysis, all patients (n=723) were operated upon by a single surgeon in our institution, during the said study period. These comprised of patients who underwent TEPA (n=664) and TAPP (n=59). We identified 120 patients with OH in our series. All of these were detected while performing TEPA. All were incidentally diagnosed 'on table' and none, on pre-operative imaging. In our unit, we have had a policy to actively look for both ipsilateral as well as contralateral OH during our TEPAs and TAPPs since 2008. During ipsilateral dissection, with awareness and a little extra effort, we are anyways able to visualise all the ipsilateral groin hernial orifices other than the site of the clinically discerned and diagnosed hernia. These are the potential sites for ipsilateral OH. However, while operating on a patient clinically having a unilateral hernia, we, as a matter of established policy and protocol, cross over and dissect the contralateral groin as well, after having completed dissection and mesh fixation on the ipsilateral clinical hernia side. This is an obvious effort to look for / rule out contralateral OH, whether clinically suspected or not. Actively dissecting and looking for contralateral OH needs much more extra effort as against ipsilateral OH, where the already performed dissection for the clinical hernia, also readily reveals any concurrent OH, if present. The patients with OH were analysed for age and sex preponderance along with the incidence rates of various occult herniae. We do not subject our patients to routine pre-operative imaging to look for OH, unless clinically suspected on the basis of symptomatology. Only patients complaining of chronic unexplained groin pain are advised a magnetic resonance imaging (MRI) of the groin area, pre-operatively. None of the patients in this series underwent a pre-operative MRI. Those who have a unilateral or bilateral clinical hernia are subjected to routine pre-operative investigations to assess fitness for anaesthesia. Males above forty with relevant symptoms are subjected to evaluation for prostatomegaly and if required, a consultation with the specialist consultant in urology. During all our TEPAs, the patients are in supine position with both upper limbs tucked in by their sides. The operating surgeon stands on the contralateral side, while the camera-assistant surgeon stands on the ipsilateral side. We perform the standard 3 trocar technique, beginning with insertion of the sub-umbilical optic trocar. This is achieved with a blunt entry into the extra-peritoneal space, through a horizontal incision made in the sub-umbilical area, a little towards the ipsilateral side. In patients with bilateral clinical herniae, the said incision is a little towards the side of the larger hernia. After entry is gained into the extra-peritoneal space by a blunt trocar, the space is then dissected telescopically using a 0^{o} telescope attached to the camera, while simultaneously instituting pneumo-insufflation. Then the contralateral working trocar is inserted 2 fingerbreadths below the mid-point of the spino-umbilical line. The instrument inserted from here does some more sharp and blunt dissection on the ipsilateral side, thereby creating space for the ipsilateral working trocar entry. Then the ipsilateral working trocar is inserted on the midpoint of the spino-umbilical line. After dealing with the clinical hernia sac, a systematic visualisation of the ipsilateral femoral and obturator orifices is performed to look out for a small indentation/pitting/defect wherein a tiny peritoneal sac may or may not be attached. Also the lateral border of the ipsilateral rectus abdominis muscle is visualised along its length as proximally as possible to look for a small occult Spigelian defect. If any of these defects are found with the sac, the peritoneal sac is carefully completely reduced. An appropriate sized mesh is then introduced and optimally spread over both the clinical as well as occult hernial defects. If the large mesh is unable to satisfactorily completely cover both the defects from all sides, an extra smaller mesh piece may be used to overlap with the large mesh and plug the smaller occult defect. This may be required especially in occult obturator and spigelian hernias. The occult femoral defect usually gets optimally covered with the one large mesh used to cover the clinical inguinal hernia defect, by pulling the spread out mesh a little more caudad, than usual. Titanium tacks are used to fix the mesh piece/s to the parietes, at safe places. Dissection is then started in the contralateral space after the operating and camera surgeons switch sides. The same steps are systematically followed on the contralateral side as well.

Statistical analysis

Data were entered in MS Excel (© Microsoft, USA) and analysed using Stata Version 15.1 (© StataCorp, College Station, Texas, USA). We estimated the means and standard deviations for linear variables, and proportions for categorical variables. The proportions were compared using the chi square test or the Fisher's exact test for low expected cell counts. A p value of <0.05 was considered to be statistically significant.

RESULTS

The age range of these 120 patients with OH was 22 to 83 years with mean age of 60.7 years (SD: ±12.5 years). Out of the 120 occult hernia patients, 51 patients had unilateral clinical hernia and 69 patients had bilateral clinical hernia. Of these 51 unilateral clinical hernia patients, 29 (56.7%) patients had ipsilateral OH (IOH)

and 22 (43.1%) patients had contralateral OH (COH). Out of the 29 patients who had IOH, 15 (51.72%%) patients had RIH (Figure 1 and 4), 10 (34.48%) patients had LIH, 3 (10.34%%) patients had right femoral hernia and the remaining 1 (3.44%) patient had right spigelian hernia (Figure 2 a and b).

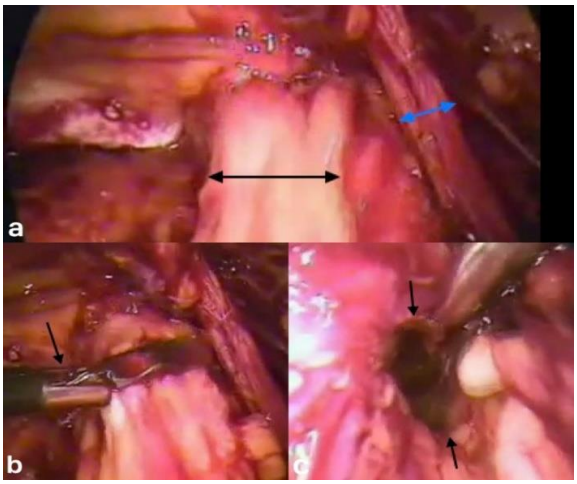

Figure 1: Operative pictures: (a) shows right clinical femoral hernia (black double headed arrow) & occult indirect RIH (blue double headed arrow), (b) shows attempts at reduction of the right femoral hernia contents (black arrow) in the same patient, (c) shows the right femoral hernia defect (black arrows) after reduction of the hernia sac.

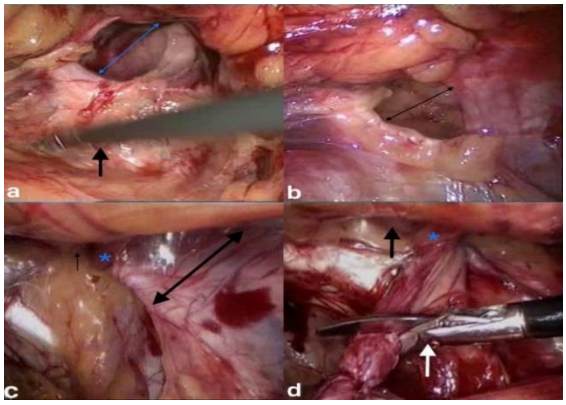

Figure 2: Operative pictures : (a) shows clinical direct RIH defect (double headed blue arrow) after reduction of the sac(black arrow), (b) shows right occult Spigelian hernia(double headed black arrow) in the same patient, (c) shows clinical indirect RIH (double headed black arrow) & occult direct RIH (small black arrow) seen medial to the inferior epigastric pedicle (blue asterisk), (d) shows division of clinical indirect RIH sac (white arrow) with occult direct RIH (black arrow) seen medial to the inferior epigastric pedicle (blue asterisk), in the same patient.

Out of the 22 patients who had COH, 9 (40.9%) patients had RIH and the remaining 13 (59.1%) patients had LIH. Of the 29 patients who had IOH, 16 (55.17%%) had ipsilateral direct inguinal hernia (IDIH) (Figure 2 c and d) and 09 (31.03%) had ipsilateral indirect inguinal hernia (IIIH) (Figure 3).

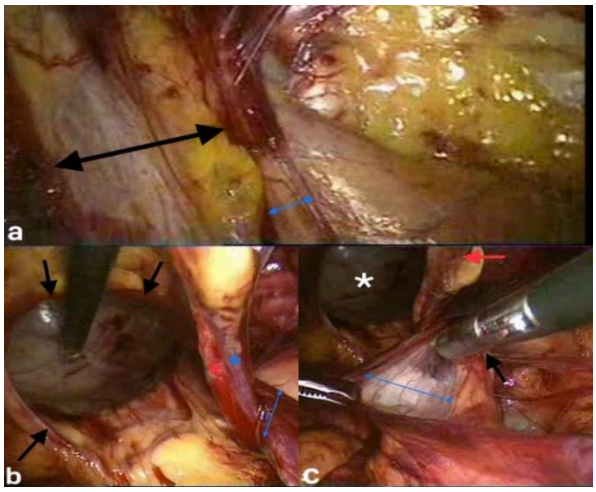

Figure 3: Operative pictures : (a) shows clinical direct RIH (double headed black arrow) & occult indirect RIH (double headed blue arrow), (b) shows the clinical direct RIH defect (black arrows) in the same patient after reduction of the sac, occult indirect RIH(double headed blue arrow) lateral to the inferior epigastric artery (red asterisk) & vein (blue asterisk), (c) shows occult indirect RIH in the same patient being dissected (double headed blue arrow), clinical direct RIH defect (white asterisk) & inferior epigastric pedicle (red arrow).

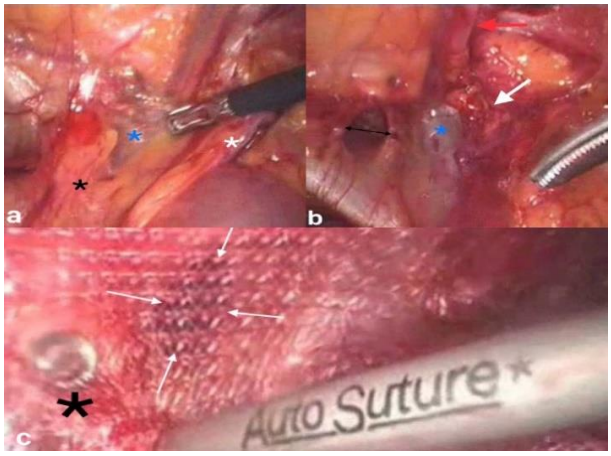

Figure 4: Operative pictures : (a) shows clinical right femoral hernia (black asterisk) just medial to the right external iliac vein (blue asterisk) and occult indirect RIH (white asterisk), (b) shows the femoral hernia defect (double headed black arrow) in the same patient after reduction of the sac just medial to the external iliac vein (blue asterisk), occult indirect RIH (white arrow) and the inferior epigastric pedicle (red arrow), (c) shows tacker fixing the prolene mesh to the superior pubic ramus (black asterisk) with the femoral hernia defect seen through the mesh (white arrows), in the same patient.

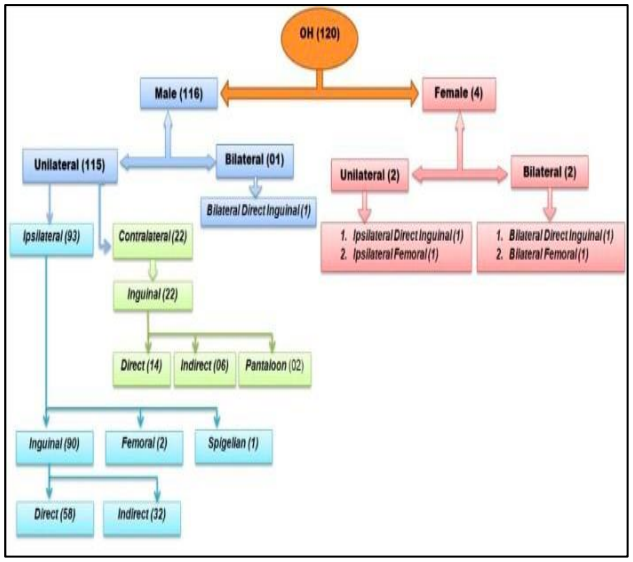

Figure 5: Occult hernia statistics (figures in the brackets denote number of patients).

Table 1: Sex, age and laterality distribution of occult hernia.

Variables	n	Incidence (%)
Occult hernia	120	16.59 (120/723)
Occult hernia in males	116	16.3 (116/710)
Occult hernia in females	04	30.7(4/13)
21-40 years	10	8.3(10/120), 3.13 (10/319)
41-60 years	46	38.3(46/120), 16.30 (46/282)
>60 years	64	53.4(64/120), 52.40 (64/122)
Occult unilateral hernia	117	97.5 (117/120)
Occult bilateral hernia	03	2.5 (3/120)
Occult ipsilateral hernia*	29	24.16 (29/120)
Occult contralateral hernia*	22	18.33 (22/120)

*Cases with clinical bilateral occult herniae were not included in the 3 rows showing age-wise distribution, the right column has 2 percentage figures. The left figure is when the denominator is total no. of OH cases. The right figure is when the denominator is total no. of lap. cases of that age range.

The remaining 4 IOH patients comprised of 3 (10.34%) patients with ipsilateral femoral hernia and 1 (3.44%) with ipsilateral spigelian hernia. Of the 22 patients who had a COH, 12 (54.54%) had contralateral direct inguinal hernia (CDIH) and 8 (36.36%) had contralateral indirect inguinal hernia (CIIH). The remaining 2 (9.09%) patients had a contralateral pantaloon hernia. Also, out of a total of 120 OH patients, 116(96.7%) were males and 4 (3.3%) were females. Out of 116 male OH patients, 115(99.13%) patients had unilateral OH (UOH) and 1 (0.87%) patient had bilateral OH (BOH). This 1 patient had bilateral direct inguinal OH. Out of the 115 male patients who had UOH, 70(60.86%) patients had right inguinal hernia (RIH), 40 (34.78%) patients had left inguinal hernia (LIH).

Table 2: Incidence rates of different types of occult herniae.

Type of occult hernia	n	Incidence (%)
Total OH	120	16.59
Inguinal OH	115	95.8
Unilateral inguinal OH	113	94.16
Unilateral right inguinal OH	70	58.33
Unilateral left inguinal OH	43	35.83
Bilateral inguinal OH	02	1.66
Direct inguinal OH	73	60.83
Indirect inguinal OH	40	33.33
Pantaloon inguinal OH	02	1.66
Femoral OH	04	3.33
Unilateral femoral OH	03	2.5
Bilateral femoral OH	01	0.83
Spigelian OH (unilateral-right)	01	0.83

Right femoral hernia and right pantaloon hernia were seen in 2 patients (1.73%) each and the remaining 1 (0.86%) patient had a right spigelian hernia. Of the 4 female OH patients, 2(50%) had UOH while the remaining 2 (50%) had BOH. The 2 female patients with UOH comprised of 1 patient with IDIH and 1 with ipsilateral femoral hernia. The 2 female patients with BOH comprised of 1 patient with bilateral direct inguinal OH and the other with bilateral femoral OH. Of the 120 patients with OH in this series, 117 (97.5%) had unilateral OH while 3(2.5%) had bilateral OH. Among the 3 patients who had bilateral OH, 1 was male (bilateral direct OH) and 2 were females. Among these 2 female patients with BOH, 1 had bilateral direct inguinal OH and the other patient had bilateral femoral OH. In our study, the occurrence of occult hernia was commoner on the right side with 61.7% of the total OH burden. Direct occult herniae (60.8%) were noted most frequently followed by indirect occult herniae (33.3%), femoral occult herniae (3.3%), pantaloon hernia (1.7%) and spigelian hernia (0.8%). The age range of the patients of this series was 22-83 years. A total of 10 (8.3%) OH patients were in the range of 21-40 years, 46 (38.3%) OH patients belonged to the age group of 41-60 years and 64(53.3%) OH patients were more than 60 years old. The patient demographics and incidence of different types of OH in our series are summarised (Figure 5, Tables 1-2). A statistical analysis of our data is also summarised (Table 3-4). As depicted in the Table 3, the incidence of direct occult hernia increases with advancing age which can be attributed to the weakness of the abdominal wall muscles in the elderly population. Increased incidence of indirect occult hernia in the younger population shows the effect of physical straining factors, which probably is more in younger age groups.

Table 3: Statistical analysis of the side, type and laterality of occult hernia with respect to age and gender.

Parameters	Total	Side of Occult Hernia			Type of occult hernia					Laterality (out of 51 unilateral cases)	
		Rt Occult	Left Occult	Bilateral Occult	Direct	Indirect	Fem Occult	Pantaloon	Spigelian	Ipsilateral	Contralateral
Total	120 (100)	74 (61.7)	43 (35.8)	3 (2.5)	73 (60.8)	40 (33.3)	4 (3.3)	2 (1.7)	1 (0.8)	29 (56.7)	22 (43.1)
Age (years)											
21-40	10 (8.3)	7 (70.0)	2 (20.0)	1 (10.0)	5 (50.0)	5 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)
41-60	46 (38.3)	32 (69.6)	14 (30.4)	0 (0.0)	26 (56.5)	17 (37.0)	1 (2.2)	2 (4.3)	0 (0.0)	12 (63.2)	7 (36.8)
>60	64 (53.3)	35 (54.7)	27 (42.2)	2 (3.13)	42 (65.6)	18 (20.1)	3 (4.7)	0 (0.0)	1 (1.6)	17 (54.8)	14 (45.2)
p value	-	0.251	0.293	0.18	0.520	0.313	0.746	0.311	>0.99	0.55	
Gender											
Female	4 (3.3)	1 (25.0)	1 (25.0)	2 (50.0)	2 (50.0)	0 (0.0)	2 (50.0)	0 (0.0)	0 (0.0)	2 (100)	0 (0.0)
Male	116 (96.7)	73 (62.9)	42 (36.2)	1 (0.86)	71 (61.2)	40 (34.5)	2 (1.7)	2 (1.7)	1 (0.9)	27 (55.1)	22 (44.9)
p value		0.157	>0.99	0.005	0.644	0.300	0.005	>0.99	>0.99	0.50	

*Cases with clinical bilateral hernia were not included in the analysis. Figures in brackets indicate percentages.

Table 4: Statistical analysis comparing the side of clinical hernia and the side, type and laterality of occult hernia.

Parameters	Total	Side of Occult Hernia			Type of occult hernia					Laterality*	
		Rt Occult	Left Occult	Bilateral Occult	Direct	Indirect	Fem Occult	Pantaloon	Spigelian	Ipsilateral	Contralateral
Total	120 (100)	74 (61.7)	43 (35.8)	3 (2.5)	73 (60.8)	40 (33.3)	4 (3.3)	2 (1.7)	1 (0.8)	29 (56.7)	22 (43.1)
Side of clinical hernia											
Left	19 (15.8)	9 (47.4)	10 (52.6)	0 (0.0)	13 (68.4)	6 (31.6)	0 (0.0)	0 (0.0)	0 (0.0)	10 (52.6)	9 (47.4)
Right	30 (25.0)	17 (56.7)	13 (43.3)	0 (0.0)	15 (50.0)	9 (30.0)	3 (10.0)	2 (6.7)	1 (3.3)	17 (56.7)	13 (43.3)
Bilateral	69 (57.5)	46 (66.7)	20 (29.0)	3 (4.4)	45 (65.2)	23 (33.3)	1 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Rt Femoral	2 (1.7)	2 (100)	0 (0.0)	0 (0.0)	0 (0.0)	2 (100)	0 (0.0)	0 (0.0)	0 (0.0)	2 (100)	0 (0.0)
p value		0.286	0.125	0.75	0.139	0.331	0.149	0.121	0.428	0.688	

*Cases with clinical bilateral herniae were not included in the analysis. Figures in brackets indicate percentages

Table 5: Review of literature on occult hernia.

Author/s	Journal (year of publication)	Type of study	Methods	Criteria/Findings	Conclusions
Miller et al[12]	JAMA surgery (2014)	Original study (to determine the efficacy of USG, CT, MRI to detect OH	Pts.who had groin pain but no hernia o/e, who underwent imaging and surgery (59 groins)	Sensitivity, specificity, positive & negative predictive values compared	MRI superior to USG & CT for diagnosis of OH
Herrington[13]	Annals of surgery (1975)	Case series	14 females underwent occult inguinal hernia repair	Diagnosed on basis of intermittency, character & localization of pain after ruling out other conditions	Absence of impulse in OH explained on basis of small hernia size & difference in male and female anatomy Incidence of OH - 8%
Jarrard et al[14]	Surgical endoscopy (2019)	Case series (297 pts. undergoing robotic IH repair)	Pre-op examinations were compared to intra-op findings to compute OH incidence	Unilateral inguinal hernia pts. found to have bilateral hernia intra-op, studied	Incidence of contralateral OH - 15.8%
J He et al[3]	BMC surgery (2021)	Case series (1066 pts.)	Study of ipsilateral OH epidemiology vis-a-vis age, gender, site	Ipsilateral OH- direct, indirect, femoral, obturator, spigelian, incidence of ipsilateral OH -8.26% direct most common (4.11%) foll. by indirect (2.45%)	Higher incidence in older pts. No difference betn. males vs. females Ipsilateral direct & indirect OH more common on right side Ipsilateral femoral OH more common on left side
Heuvel et al[15]	Surgical endoscopy (2013)	Case series (1681 pts.)	TAPP repair performed in all	Incidence of true OH & IH i.e. beginning hernia studied. True OH repaired, IH observed	Incidence of contralateral OH-13%, Incidence of true OH–8%, IH-5%, 21% of IH became symptomatic needing repair (after a mean period of 88 months)
Halil et al[16]	Surg Lap Endosc Percutan Tech (2020)	Original article	USG done on contralateral site of clinically unilateral hernia pts.	Incidence of contralateral OH studied, surgical repair done if OH found, in the same sitting contralateral OH found in 55% pts.	Need for 2nd surgery with it's complications prevented by noninvasive easily available USG Recommend routine contralateral USG
Jain et al[17]	Journal of Min Access Surg (2008)	Case series (4 pts.)	Routine visualization of contralateral groin, ipsilateral other potential orifices	During TAPP, both groins were visualised in detail. During TEPA, only ipsilateral groin was explored in detail	Lap surgery allows diagnosis of groin & pelvic OH, Concurrent repair of OH may reduce incidence of postop. recurrence & persistence of symptoms
Walker et al[18]	Post-graduate medical journal-BMJ (2001)	Original article (41 pts.)	Herniograms performed for suspected OH cases	25 groin hernias identified radio-logically-23 on symptomatic & 2 on asymptomatic side 21 pts. Underwent surgery, hernia confirmed in 19 (true positive rate 90.5%)	16 pts.with negative herniograms did not develop hernia over a median follow up period of 28 months Herniography is a safe & reliable method to detect/exclude OH

OH-occult hernia, IH-insipient hernia, o/e-on examination, pts.-patients

These age-wise trends of direct and indirect OH, though interesting, were found to be statistically insignificant with p values of 0.520 and 0.313 respectively. Similarly, the incidence of right sided occult hernia decreases as the age increases, with a p value of 0.251. The statistical comparison between the side of clinical hernia and the side and type of OH (Table 4), revealed that there were increased chances (57.5%) of finding an occult hernia in bilateral clinical cases with no statistically significant difference in the occurrence of the type of occult hernia. In our study, only the occurrence of femoral occult and the bilateral occult herniae in women were of statistical significance, with p-values of 0.005 (Table 3). Femoral occult hernia was significantly more common in women compared with men (50% vs. 1.7%; p=0.005). Similarly bilateral occult hernia was significantly more common in women compared with men (50% vs. 0.86%; p=0.005).

DISCUSSION

Groin pain is a frequent complaint in surgical practice with an inguinal hernia being at the top of the differential diagnoses. Varicocele, inguinal lymphadenitis, epididymitis, prostatitis and chronic appendicitis are other causes of groin and lower abdominal pain. Most of the inguinal hernias can be diagnosed clinically. For patients with groin pain in whom no swelling can be identified, current guidelines advise ultrasonography (USG) of the groin followed by MRI, if USG is inconclusive.[1,2] When additional imaging shows a hernia that could not be detected clinically, this entity is called an occult hernia. The 2018 international consensus guidelines for the diagnosis and treatment of inguinal hernia by the HerniaSurge group indicate that occult hernia is an asymptomatic hernia not detectable by physical examination.[3] The current guidelines do not provide a specific therapeutic approach for this type of hernias.[1,2] Most patients with symptomatic inguinal hernias do not require preoperative imaging because physical examination findings are diagnostic. However, in a subset of patients with groin or pelvic pain due to an occult source, termed a hidden hernia, it's repair will relieve the pain. Most current texts and hernia references recommend only USG and computed tomography (CT) scan as modalities for evaluation for hernias, especially those not readily evident on physical examination.[4,5] Herniography has fallen out of favour with most practices because it is invasive and traumatic with a risk of visceral injury.[4,5] Some authors have suggested that, although MRI is likely more effective than the alternative imaging techniques, the theoretical improvement is not enough to justify the increased expense.[6] As per literature, incidence of development of inguinal hernia on the contralateral side after having undergone surgical repair on one side is 10.8% with a compounding rate of 1.2% per each passing year after the initial surgery.[7,8] This significant figure underscores the importance of performing concurrent repair of an incidentally detected asymptomatic contralateral OH. The other important but contrasting factor to consider here is the commonest complication of inguinal hernia surgery i.e., chronic groin pain in the post-operative period. The decision to operate on the asymptomatic opposite side has to be well balanced, considering both the above-mentioned factors. The incidence of chronic groin pain after open inguinal hernia surgery is as high as 30%.[9] But its prevalence after laparoscopic repairs is just 6%.[10] This seems to decline as time passes, after laparoscopic repairs; with a distinct decrease at 3.5 years post-operatively.[11] Thus, it makes practical sense to concurrently repair incidental contralateral OH, during laparoscopy. Also, it is more important to detect contralateral OH vs ipsilateral OH. This is because of 2 reasons; on the ipsilateral side, the already performed dissection for the clinically evident and diagnosed hernia also reveals the occult hernia, most of the times. However, on the contralateral side, one has to deliberately cross over and dissect, in order to visualize the hernia orifices. Also, on the ipsilateral side, there is anyways a mesh covering the clinically evident hernial and other orifices. However, if a contralateral OH is diagnosed, an additional mesh has to be inserted and placed optimally over it. Thus, to summarise, there are 2 diagnostic scenarios for OH. The first is when patients present with unexplained groin pain. This is a typical group/subset of patients who are usually manual labourers, soccer/lawn tennis players, weight lifters etc in whom the physical examination is normal. They are then subjected to a USG of the groin area. If this is inconclusive, a CT scan or MRI is done. One of these imaging investigations diagnose the occult hernia, which is then surgically repaired. The other subset of patients are those in whom the OH is/are diagnosed incidentally, 'on table', during laparoscopy; as seen in this series. These are the patients in whom the OH is silent and asymptomatic. A review of recent literature touching upon all aspects of OH has been summarised (Table 5).

Limitations

Being retrospective in nature, this study is prone to recall and misclassification biases. Also, it provides a more inferior level of evidence. By virtue of it being an observational study, it has many limitations. Since this is a single centre, hospital-based study; the results cannot be generalized. Also, the cost effectiveness of concurrent surgical repair, especially of contra-lateral OH has not been studied in this paper.

CONCLUSION

This study shows that there is a significant incidence of OH. If not repaired concurrently, these would probably symptomatically manifest later and require another surgery, then. This highlights the importance of consciously looking for them during routine surgery on both, ipsilateral as well as contralateral sides, and if found, to repair them concurrently. This way, apart from the obvious convenience to the patient, the additional

financial burden on the health care infrastructure would also reduce significantly.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Manoharan V, Joshi AS. Occult hernia: role of laparoscopy in detecting the unseen. Int Surg J 2023;10:97-104.