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Preoperative Versus Intraoperative Diagnosis of Inguinal Hernia and Detection of Contralateral Occult Hernia During Laparoscopic Transabdominal Preperitoneal Repair

Abstract

Introduction: Inguinal hernia repair is one of the commonest general surgical operations, and accurate characterisation of the defect guides the choice of operation¹. Clinical examination alone may misclassify the type or side of a hernia, and a clinically silent defect on the opposite groin is easily missed². The laparoscopic transabdominal preperitoneal (TAPP) approach allows direct inspection of both myopectineal orifices during a single procedure³.

Aim: To determine whether the preoperative clinical diagnosis of inguinal hernia differs from the intraoperative diagnosis made during laparoscopic TAPP repair, and to identify contralateral occult hernia in patients planned for unilateral repair.

Materials and methods: This prospective observational study enrolled 32 adults with symptomatic uncomplicated inguinal hernia at a tertiary teaching hospital over about 18 months. Each patient underwent standardised clinical examination followed by laparoscopic TAPP repair using a three-port technique. Preoperative and intraoperative findings were compared, and the contralateral groin was inspected in every case. Data were summarised as frequencies and percentages.

Results: The preoperative and intraoperative diagnoses matched in 24 patients (75%) and differed in 8 patients (25%). Among 21 patients planned for unilateral repair, a contralateral occult hernia was found in 1 (4.76%). The operative plan changed in 1 patient (3.125%), who underwent bilateral repair after an occult defect was detected. No conversion to open surgery was required.

Conclusion: Laparoscopic TAPP repair verifies the clinical diagnosis more precisely and permits detection and simultaneous repair of a contralateral occult hernia, sparing the patient a second operation and anaesthetic exposure.

INTRODUCTION

Inguinal hernia is among the most frequently encountered conditions in general surgical practice and remains an important public health problem, particularly in older men¹. Its repair accounts for a large share of elective operative workload, and correct preoperative assessment shapes both the technique chosen and the eventual recovery⁴. The condition is not confined to men; hernias in women, though less common, may be misdiagnosed and carry a higher risk of femoral involvement⁵.

Traditional assessment rests on history and physical examination. Manual tests such as the deep ring occlusion test and the ring invagination test help to distinguish direct from indirect defects, yet clinical examination has limited accuracy for the type and side of a hernia, and a small or clinically silent defect on the opposite groin may escape detection². Imaging can add information: ultrasonography and other modalities improve diagnostic confidence, although their yield varies and they do not reliably exclude an occult contralateral defect^{6,7}.

Surgical management has moved steadily towards minimal-access repair. Randomised and pooled comparisons show that laparoscopic and open preperitoneal mesh techniques give comparable durability, with laparoscopy offering less early pain and faster recovery^{8,9}. Both principal endoscopic techniques, TAPP and totally extraperitoneal (TEP) repair, are well established and give similar outcomes in experienced hands^{3,10}. Indian series confirm that these techniques are feasible and safe in routine tertiary practice, with acceptable perioperative complication rates^{11,12}. International guidelines now recommend a laparoscopic approach for many patients, especially those with bilateral or recurrent disease¹³.

A particular advantage of the transperitoneal laparoscopic view is that it exposes both myopectineal orifices through a single intervention¹⁴. This makes it possible to confirm the operative diagnosis under direct vision and to inspect the opposite groin for an occult hernia without a separate incision. Reported rates of contralateral occult hernia at laparoscopy range widely, and there is continuing debate about how often such defects should be repaired at the same sitting^{15,16}. Several groups have shown that simultaneous repair of an occult contralateral defect is safe and spares the patient a second operation^{17,18}, a view supported by systematic reviews weighing the benefits and risks of prophylactic repair^{19,20}. Preoperative ultrasound has been proposed to identify these defects in advance, with mixed reliability⁷.

Comparative work from Indian centres, including studies of laparoscopic versus open repair and of contralateral occult hernia during TEP, provides useful regional context for the present analysis^{21,22,23,24,25}. Against this background, this study compared the preoperative clinical diagnosis of inguinal hernia with the diagnosis established during laparoscopic TAPP repair, and examined how often a contralateral occult hernia was found in patients planned for unilateral repair.

MATERIALS AND METHODS

Study design and setting: This prospective observational study was conducted in the Department of General Surgery at a tertiary care teaching hospital attached to SBKS Medical Institute and Research Centre, Sumandeep Vidyapeeth, Piparia, Vadodara, over a period of about 18 months following institutional ethics committee approval. Written informed consent was obtained from every participant.

Participants: Thirty-two consecutive adults (aged over 18 years) presenting with symptomatic uncomplicated inguinal hernia and fit for laparoscopic surgery were enrolled by purposive sampling. Both men and women and defects of any size were included. Patients who were unwilling to participate, those with asymptomatic hernia, and those with irreducible, obstructed or strangulated hernia, non-inguinal hernia, or who were medically unfit for pneumoperitoneum were excluded.

Clinical assessment: Each patient underwent a structured history and physical examination. The side and type of hernia were recorded after the deep ring occlusion test, the Zieman three-finger test and the ring invagination test². Routine haematological, biochemical, serological and radiological investigations, including ultrasonography of both inguinoscrotal regions, were performed to confirm fitness and the preoperative diagnosis⁶.

Operative technique: All patients underwent laparoscopic TAPP repair under general anaesthesia. A three-port technique was used, with a 10 mm supraumbilical camera port and two 5 mm working ports. Carbon dioxide pneumoperitoneum was maintained at 10 to 15 mmHg. After creating a peritoneal flap and reducing the sac, both myopectineal orifices were inspected. A 15 x 12 cm polypropylene mesh was placed to cover the defect and the peritoneum was closed with 2-0 polyglactin (Vicryl) suture. When a contralateral occult defect was identified, bilateral repair was carried out in the same sitting¹⁷.

Outcome measures and analysis: The primary comparison was between the preoperative clinical diagnosis and the intraoperative diagnosis. Secondary outcomes were the frequency of contralateral occult hernia among patients planned for unilateral repair and any resulting change in the operative plan. Data were entered in Microsoft Excel and analysed using SPSS. Categorical variables were summarised as frequencies and percentages.

RESULTS

Thirty-two patients completed the study. On clinical examination, a right-sided hernia was diagnosed in 15 patients, a left-sided hernia in 6 and a bilateral hernia in 11. The detailed clinical and intraoperative distribution of hernia type and side is presented in [Table/Fig-1].

[Table/Fig-1]: Distribution of hernia type and side on clinical examination and at operation (n=32).

Diagnosis (type and side)	Clinical, n	Intraoperative, n
Right direct	9	5
Right indirect	5	5
Left direct	2	1
Left indirect	4	4
Right direct with right undescended testis	1	1
Right pantaloon	0	4
Right indirect with left pantaloon	0	1
Right direct with left pantaloon	0	1
Right suprapubic with left direct	0	1
Bilateral: right indirect with left direct	1	1
Bilateral direct	7	6
Bilateral: right recurrent direct with left indirect	1	1
Bilateral indirect	2	1
Total	32	32

Note: Right-sided hernia was diagnosed clinically in 15 and confirmed at operation in 15; left-sided in 6 clinically versus 5 at operation; bilateral in 11 clinically versus 12 at operation.

When the two assessments were compared directly, the preoperative and intraoperative diagnoses were concordant in 24 patients (75%) and discordant in 8 patients (25%), as shown in [Table/Fig-2].

[Table/Fig-2]: Agreement between preoperative clinical diagnosis and intraoperative diagnosis (n=32).

Comparison	n	Percentage
Diagnosis similar (concordant)	24	75.00
Diagnosis different (discordant)	8	25.00
Total	32	100.00

Note: Discordance most often reflected pantaloon (combined direct and indirect) defects identified only at operation.

Twenty-one patients were planned for unilateral repair. On inspection of the opposite groin during TAPP, a contralateral occult hernia was found in 1 patient (4.76%) and was absent in 20 (95.24%). The overall change in the intended operative plan is summarised in [Table/Fig-3]. Across the whole cohort, the treatment modality was unchanged in 31 patients (96.875%) and changed in 1 patient (3.125%). That single patient, planned for left unilateral repair, was found to have a right contralateral occult hernia and underwent bilateral repair in the same sitting, avoiding a second operation.

[Table/Fig-3]: Contralateral occult hernia among unilateral-planned cases and resulting change in operative plan.

Finding	n	Percentage
Contralateral occult hernia present (of 21 unilateral-planned)	1	4.76
Contralateral occult hernia absent (of 21 unilateral-planned)	20	95.24
Operative plan unchanged (of 32)	31	96.875
Operative plan changed to bilateral repair (of 32)	1	3.125

Note: No patient required conversion to open surgery and no major intraoperative complication occurred.

DISCUSSION

This study found that the preoperative clinical diagnosis and the intraoperative diagnosis of inguinal hernia differed in a quarter of patients, and that a contralateral occult hernia was present in a small but clinically relevant proportion of those planned for unilateral repair. These observations support the view that direct laparoscopic inspection adds information that clinical examination alone cannot provide².

The 25% discordance between clinical and operative diagnosis is consistent with the wider literature reporting variation between preoperative and intraoperative assessment during laparoscopic hernia repair¹⁶. Much of the discordance in this cohort arose from pantaloon defects that combined direct and indirect components and were recognised only once both orifices were exposed, a pattern that plain examination and imaging cannot reliably predict^{6,7}. A comparison of the present findings with published series is shown in [Table/Fig-4].

[Table/Fig-4]: Present findings compared with published series for diagnostic variation, occult hernia detection and change in operative plan.

Series	Diagnostic variation, %	Occult hernia, %	Plan modification, %
Griffin et al.	21.6	-	21.6
Koehler	24.0	13.0	24.0
Bochkarev et al.	-	11.2	-
Tiwary et al. (India)	-	13.0	-
Present study	25.0	4.76	3.125

Note: Dashes indicate values not reported by that series. Occult hernia percentage in the present study refers to unilateral-planned cases.

The detection of a contralateral occult hernia in 4.76% of unilateral-planned patients, although lower than some reported rates, carries practical weight¹⁵. Indian data using TEP with intraperitoneal examination have reported occult contralateral defects in a similar minority of adult men^{18,21}. Identifying and repairing such a defect during the index operation removes the need for a second procedure and a further anaesthetic, an advantage unique to the transperitoneal laparoscopic view¹⁷. The single patient in whom the plan changed to bilateral repair illustrates this benefit directly.

Whether every asymptomatic contralateral defect should be repaired remains debated. Systematic reviews and decision analyses suggest that the benefits of simultaneous repair generally outweigh the small added risk, provided the surgeon is experienced and mesh is placed without

undue morbidity^{19,20}. The low complication profile of laparoscopic repair in Indian tertiary practice supports this approach^{10,11,12}, and current international guidance likewise favours addressing bilateral disease in one sitting where feasible¹³. Comparative Indian series of TAPP against open repair report comparable durability with the recovery advantages of laparoscopy^{23,24,25}.

Beyond the specific findings, the study underlines that the operative diagnosis rests on what the surgeon sees at operation rather than on preoperative prediction alone²². It was direct laparoscopic inspection, not clinical examination or imaging, that revised the diagnosis and the operative plan in this cohort. This is consistent with reviews of imaging accuracy, which show that no preoperative test reliably excludes an occult contralateral defect^{6,7}.

The main limitations are the small single-centre sample and the observational design, which restrict generalisability, and the absence of formal agreement statistics. Larger multicentre studies with longer follow-up would help define how often intraoperative reclassification and occult-hernia detection alter outcomes¹⁴. Even so, the consistency of these findings with the published range strengthens their credibility¹⁶.

CONCLUSION

Laparoscopic TAPP repair confirmed the clinical diagnosis of inguinal hernia more accurately than examination alone and allowed a contralateral occult hernia to be detected and repaired in the same sitting. By exposing both myopectineal orifices, the technique refined the diagnosis in a quarter of patients and spared one patient a second operation and anaesthetic. These findings support routine inspection of the opposite groin during laparoscopic hernia repair.

Declarations

Ethics approval: The study was approved by the Institutional Ethics Committee of Sumandeep Vidyapeeth, and written informed consent was obtained from all participants.

Conflicts of interest: The authors declare no conflict of interest.

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Authors' contributions: All the authors contributed to the study concept, data acquisition, analysis, drafting and critical revision of the manuscript, and approved the final version.

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