Original Article

Early Clinical Outcomes Following Laparoscopic Vs. Open Mesh Repair of Inguinal Hernia

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Abstract

Background: *As a part of modern surgical procedure, laparoscopic mesh repair of inguinal hernia should be safe, effective and have a short period of convalescence.* ***Objective:*** *This study was designed to compare the outcome following inguinal hernia repair, performed by laparoscopic technique and open mesh Lichtenstein (tension-free) repair.* ***Materials and Methods:*** *This prospective quasi experimental study was carried out in the department of surgery, Bangabandhu Sheikh Mujib Medical University, for a period of twelve (12) months. Total thirty six patients of inguinal hernia were included in this study.* ***Result:*** *Mean (±SD) age was 38.17 (±8.64) years. Mean (±SD) time for unilateral inguinal hernias were 55.30 (±11.01) minute in open mesh repair where as 76.07 (±13.71) minute in laparoscopically. For bilateral inguinal hernia, mean (±SD) time for open mesh repair was 92.4 (±10.26) minute and 81.2 (±10.44) minute in laparoscopically Seroma formation was in 4 patients of open mesh repair where as 5 patients of laparoscopic mesh repair. Sixteen patients of laparoscopic mesh repair needed more anaesthetic narcotics 16 patients of laparoscopic mesh repair had return to work within two weeks of surgery whereas only 10 (55.6%) patients of open mesh repair had return to work during same period of time. Pain at surgical site and discomfort was more in open mesh repair.* ***Conclusion:*** *Laparoscopic mesh repair is better than open mesh repair of inguinal hernia.*

Key words: *Inguinal hernia, Mesh repair, TAPP, TEP.*

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Introduction

Surgical repair of inguinal hernia is a common procedure in adult men. However, postoperative pain and disability are frequent.[1-5] After the introduction of tension-free surgical repair with the use of prosthetic mesh, patient's comfort was reported to be substantially improved over that obtained by the traditional, tension-producing techniques.[6] A laparoscopic method of performing a tension-free repair has subsequently been reported to result in less pain in the immediate postoperative period and earlier return to normal activities than the open repair technique.[7] The ideal method of hernia repair would cause minimal discomfort to the patient, both during the surgical procedure and in the postoperative course. It would be technically simple to perform and easy to learn, would have a low rate of complications and recurrence and would require only a short period of convalescence. The optimal operative approach for inguinal hernia repair is still debatable.[8] Most techniques involve reinforcement of the Inguinal floor with a synthetic or biologic material to obtain a tension-free repair. Open mesh-based repairs are considered easier to learn and to teach than laparoscopic repairs.[9] But laparoscopic mesh repair has a definite role in modern surgery. Laparoscopic mesh repair of Inguinal hernia is associated with greater patient satisfaction and better cosmetic results than its open counterpart but has a longer learning curve.[10] Trans-abdominal pre-peritoneal mesh repair (TAPP) and Totally extra-peritoneal (TEP) are the two techniques performed laparoscopically for Inguinal hernia. Therefore, the safety, benefits and periods of convalescence of laparoscopic mesh repair over open mesh repair should be evaluated.

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Materials and Methods

This study was prospective, quasi experimental and conducted in department of Surgery, Bangabandhu Sheikh Mujib Medical University over a period of one year. Total 38 patients of diagnosed patients of inguinal hernia admitted in the Department of Surgery, Bangabandhu Sheikh Mujib Medical University fulfilling the selection criteria were included and divided in two groups.Purposive sampling was done and semi-structured Questionnaire was used for data collection. Statistical analyses were performed by using SPSS for windows version 20.

Results

Table I: Age distribution

Age (Years)	Number of Patients	Percentage (%)
19 – 28	4	11.1
29 – 38	14	38.9
39 - 48	15	41.7
49 - 58	3	8.3
Total	**36**	**100**
Mean ± SD	38.17 ± 8.64	
Range (Min-Max)	19 - 57	

In this series of 36 patients, age ranged from 18 years to 58years. Maximum 15 (41.7%) patients were belonged to the age group of 39 - 48 years followed by 14 (38.9%), 4 (11.1%) and 3 (8.3%) patients were in age group 29 - 38 years, 19 - 28 years and 49 - 58 years age group respectively. Mean (±SD) age was 38.17 (±8.64) years within the range of 19 - 57 years. (Table I)

Table II : Clinical presentation of inguinal hernia

Clinical presentation	Number of patien n = 36	Percentage (%)
Primary	36	100
Direct	16	44.4
Indirect	20	55.6
Unilateral	26	72.2
Bilateral	10	27.8
Complete	15	41.7
Incomplete	21	58.3
Reducible	36	100

All patients presented with primary reducible inguinal hernia. Unilateral inguinal hernia was in 26 (72.2%) patients. Indirect inguinal hernia was in 20 (55.6%) patients. 15 (41.7%) patients was presented as complete inguinal hernia (Table II)

For bilateral inguinal hernia, total 10 patients were undergone for surgery.

For unilateral inguinal hernia, total 26 patients were undergone for operation.

Operative procedure

Table-III: Operative procedure of inguinal hernia

Technique	Number of patients n = 36
Open mesh repair	18
Laparoscopic mesh repair	18

Open tension free Lichtenstein mesh repair was performed in 13 patients of unilateral and 5 patients of bilateral inguinal hernia. Laparoscopic mesh repair was performed in 5 patients of bilateral inguinal hernia and 7 patients of unilateral inguinal hernia (Table III)

Findings	Number of patients n = 36	Percentage (%)
Inguinal hernia	36	100
Direct	16	44.4
Indirect	20	55.6
Bilateral assessment in unilatera inguinal hernia	7	26.9

Per operative findings of direct and indirect inguinal hernia were equal to clinical presentation. Bilateral assessments in unilateral inguinal hernias were possible only in TAPP procedure (Table IV)

Table V: Operating time in unilateral inguinal hernia

Time in Minute	Open mesh rep n = 13	Laparoscop n = 13	p Value (Student-T Test)
30- 60	7	0	
60- 90	6	4	
90- 120	0	3	
Mean ± SD	55.30±11.01	76.07±13.7	0.001

Table VI: Operating time in bilateral inguinal hernia

Time in Minute	Open mesh repa n = 5	TAPP n = 5	p Value (Student-T Test)
30-60	0	0	
60-90	2	4	
90-120	3	1	
Mean ± SD	92.4±10.26	81.20±10.4	0.126

Mean (±SD) time for unilateral inguinal hernias were 55.30 (±11.01) minute in open mesh repair where as76.07 (±13.71) minute in laparoscopic mesh repair ($p<0.05$). For bilateral inguinal hernia, mean (±SD) times for open mesh repair were92.4 (±10.26) minute and 81.2 (±10.44) minute in laparoscopic mesh repair ($p>0.05$) (Table VI).

Table VII: Per operative complications

Complication	Open mesh repair	Laparoscopic mesh repair
Vascularinjury	3	3
Injury to vas deferens	0	0
Bowel injury	0	0
Urinary bladder injury	0	0

Testicular vessels were injured in six (16.7%) patients. There was no complication regarding injury to vas deferens, bowel injury or urinary bladder injury (Table VI**)**

Table VIII: Early post operative complications

Complication	Open mesh repa	Laparoscopi mesh repair	p Value (Chi-Square Test)
Seroma / Haematoma Formation	4	5	
Urinary retention	3	0	0.024
Testicular pain	5	1	
wound infection	0	0	

Seroma/haematoma formation was in 4(22.2%) patients of open mesh repair where as 5(27.8%) patients of laparoscopic mesh repair. Urinary retention was only in 3(16.7%) patient of open mesh repair as because all the patients of laparoscopic mesh repair underwent pre-operative urinary catheterization.

Testicular pain was in 5(27.8%) patients of open mesh repair. There is no wound infection in this series ($p<0.05$) (Table VIII)

Table IX: Use of narcotics per day post operatively

Narcotics	Open mesh repai	Laparoscop mesh repair	p Value (Chi-Square Test)
1 ampoule	10	2	
2-4 ampoule	8	16	0.012
> 4 ampoule	0	0	

Patients of laparoscopic mesh repair use more narcotics than open mesh repair group.

Table X: Hospital stay post operatively

Hospital stay	Open mesh repair n = 18	Laparoscopic me repair n = 18	p Value (Student-Test)
1 day	2	3	
2 days	8	12	
3 days	7	2	
> 3 days	1	1	
Mean ± SD	2.1±0.73	2.4±0.78	0.173

15 (83.3%) patients of laparoscopic mesh repair had two days or less hospital stay whereas 8 (44.4%) patients of open mesh repair had more than 2 days hospital stay ($p>0.05$). (Table VI+

Table XI: Return to work

Return to worl	Open mesh repa n = 18	Laparoscopic mesh repair n = 18	p Value (Student-Test)
< 10 days	6	12	
11-14 days	4	4	0.019
15-21 days	8	2	

16(88.9%) patients of laparoscopic mesh repair had return to work within two weeks of surgery whereas only 10 (55.6%) patients of open mesh repair had return to work during same period of time($p<0.05$).(Table XI)

Table XII: Post operative pain at 3 weeks

Pain treated with analgesics	Open mesh repair	Laparoscopic mesh repair	p Value (Chi-Square Test)
No	12	16	0.228
Occasional	6	2	

16(88.9%) patients of laparoscopic mesh repair needed no analgesia whereas 6(33.3%) patients of open mesh repair needed occasional analgesia at three week post-operatively ($p>0.05$). Table XII

Table XIII: Post operative Discomfort at 3 weeks

Discomfort	Open mesh repair	Laparoscopic mesh repair	p Value (Chi-Square Test)
Mild	6	14	0.018
Moderate	12	4	

14 (77.9%) patients of laparoscopic mesh repair had mild discomfort whereas 12(66.7%) patients of open mesh repair had moderate discomfort at 3 weeks postoperatively ($p<0.05$). Table XIII

Recurrence

There was no recurrence at 3 weeks post-operatively in patients of both open and laparoscopic mesh repair.

Discussion

This prospective, quasi experimental study was carried out in the department of Surgery, Bangabandhu Sheikh Mujib Medical University. Total 36 patients of inguinal hernia, 18 patients in each group, have been studied prospectively during a period of 12 months to determine the early clinical outcomes following laparoscopic vs open mesh repair of inguinal hernia. Out of total 36 patients, maximum 15 (41.7%) patients were belonged to the age group of 39-48 years followed by 14 (38.9%), 4 (11.1%) and 3 (8.3%) patients were in age group 29-38 years, 19-28 years and 49-58 years age group respectively. Mean (±SD) age was 38.17 (±8.64) years within the range of 19-57 years. The study of Singh et al. reported that mean age was 36.81 years.[11] All patients were male. All 36 male patients were presented with primary reducible inguinal hernia. Unilateral inguinal hernia was in 26 (72.2%) patients and bilateral inguinal hernia was in 10 (27.8%) patients. 20 (55.6%) patients were presented with indirect inguinal hernia and rest 16 (44.4%) patients had direct inguinal hernia. 21 (44.4%) patients had incomplete inguinal hernia and rest 15 (41.7%) patients had complete inguinal hernia. Open tension freeLichtenstein mesh repair was performed in 13 patients of unilateral and 5 patients of bilateral inguinal hernia. Laparoscopic mesh repair was performed in 5 patients of bilateral inguinal hernias and 13 patients of unilateral inguinal hernia. Per operative findings of direct and indirect inguinal hernia were equal to clinical presentation. Bilateral assessments in unilateral inguinal hernias were possible only 7 (26.9%) patients of unilateral inguinal hernia in TAPP procedure.Mean (±SD) time for unilateral inguinal hernias were 55.30(±11.01) minute in open mesh repair whereas 76.07 (±13.71) minute in laparoscopic mesh repair. For bilateral inguinal hernia, mean (±SD) times for open mesh repair were 92.4 (±10.26) minute and 81.2 (±10.44) minute in laparoscopically. In case of unilateral inguinal hernia, open mesh repair had less operating time than laparoscopic procedure whereas in bilateral inguinal hernia, laparoscopic mesh repair had less operating time than open mesh repair. Similar result was reported in the study of Singh V et al.[11] and Memon et al.[12] Only 6 (16.7%) patients had per-operative bleeding from testicular vessels. There were no complications regarding injury to vas deferens, bowel injury or urinary bladder injury. Per-operative complications were equal to both groups.Seroma/haematoma formation was in 4 (22.2%) patients of open mesh repair whereas 5(27.8%) patients of laparoscopic mesh repair but condition improved without any intervention. Urinary retention was only in 3(16.7%) patient of open mesh repair as because all the patients of laparoscopic mesh repair underwent pre-operative urinary catheterization. Testicular pain was in 5(27.8%) patients of open mesh repair and 1 (5.6%) patients in laparoscopic mesh repair. There is no mesh or wound infection in this series. Open mesh repair had slightly more complication than laparoscopic mesh repair. Study of El-Dhuwaib at al.[13] also reported similar result.In this study, 16 (88.9%) patients of laparoscopic mesh repair needed more anaesthetic narcotics than open mesh repair patients 8 (44.4%) post operatively. In this study, 15 (83.3%) patients of laparoscopic mesh repair had two days or less hospital stay whereas 8 (44.4%) patients of open mesh repair had more than two days hospital stay. Patients of laparoscopic mesh repair had less post operative hospital stay than patients of open mesh repair. Similar result was reported in the study of Andersson B et al.[12-14] (66.7%) patients of laparoscopic mesh repair had return to work within 10 days whereas only 6 (33.3%) patients of open mesh repair returned to work within 10 days post-operatively. 16 (88.9%) patients of laparoscopic mesh repair had return to work within two weeks of surgery whereas only 10 (55.6%) patients of open mesh repair had return to work during same period of time. Similar result was reported in the study of Andersson et al.[14] and Johansson et al.[15] All patients had returned to work within three weeks. At 3 weeks post-operatively, pain at surgical site was more in open mesh repair (33.3%) than laparoscopic mesh repair (11.1%). Discomfort at surgical site was more in open group (66.7%) than laparoscopic group (22.2%). there is no recurrence at 3 weeks post-operatively in patients of both open and laparoscopic mesh repair. Patients of laparoscopic mesh repair had better clinical outcomes than patients of open mesh repair. Similar result was reported in the study of Kumar et al.[4]

Conclusion

Laparoscopic mesh repair of inguinal hernia had fewer periods of convalescence, post-operative pain and discomfort at surgical site but had more use of anaestheticnarcotics than open mesh repair. Operating time was more in laparoscopic group in case unilateral inguinal hernia but in case of bilateral inguinal hernia, laparoscopic mesh repair had less operating time than open mesh repair. Per-operative complications were equal to both group but post operative early complications were more in open group than laparoscopic group. Bilateral assessment in unilateral inguinal hernia was only possible in TAPP procedure.

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