

Is Laparoscopic Groin Hernia Repair Better Than Open Mesh Repair?

S Jain, C Norbu

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Abstract

Laparoscopic Groin Hernia repair has gained popularity during the last decade. There is not enough literature to recommend its routine use in unilateral groin hernia repair. This article reviews the status of laparoscopic groin hernia repair in the present scenario.

INTRODUCTION

In 1984, Lichtenstein et al coined the term “Tension-Free Hernioplasty” and broke the convention by advocating routine use of mesh for hernia repair, thereby making tissue repair a thing of the past.

Real controversy started in 1990, when laparoscopic Tension-Free repair came in to vogue and was routinely advocated and aggressively marketed by promising less pain and shorter recovery period, but the things in the small prints were completely ignored.

HOW TO DECIDE WHICH APPROACH IS BETTER

The most scientific way to come to conclusion over superiority of one method over other is on the basis of evidence-based medicine. The best evidences are in the form of Meta -analysis or randomized controlled trials.

Oranges cannot be compared with apples; similarly laparoscopic mesh repair cannot be compared with open tissue repair. So it has to be comparison between laparoscopic mesh repair and open mesh repairs. Few of the initial trials (Liem₁, Stoker₂, and Grant₃) compared laparoscopic mesh repair with open tissue repair and came to conclusions, which are not valid.

METHODS

In the present article, we have tried to analyze the available meta -analyses or randomized controlled trials comparing laparoscopic mesh repair versus open mesh repair of inguinal hernia. We did not analyze those trials, which compared lap mesh repair and open tissue repair, because

there would be inherent superiority of lap mesh repair in the form of low recurrence rate by virtue of placement of mesh.

Available literature was analyzed with regards to

1. Recurrence Rate
2. Complications
3. Operating time
4. Cost effective ness
5. Return to work and activity
6. Post operative pain

RECURRENCE RATE

An ideal approach to hernia repairs should have a low recurrence rate. Recurrence rates in various series are shown in table 1.

VA trial₄ concluded in 2004 involving 2164 patients in 14 centers in USA measured recurrence of hernia at two years as the primary outcome. Recurrence was found to be 10.1% in the laparoscopic group and 4.1% for open group in the repair of primary inguinal hernias, but rates of recurrence were similar in two groups after repair of recurrent hernias (10% and 14.1% respectively).

Figure 1

Table 1: Studies comparing recurrence in laparoscopic versus open mesh repair

First author	Laparoscopic	Open
MRC Lap ⁵ Groin Hernia trial group	1.9%	0
Champault ⁶	6%	2%
Neumayer ⁴	10.1%	4.9%
NICE 2004 ⁷	2.3%	1.3%
Andersson ²¹	2.5%	0%

MRC₅ laparoscopic hernia trial group found 1.9% recurrence rate in laparoscopic group and zero percent recurrence rates in open group at one year. This study involved 928 patients with groin hernias from 26 hospitals in UK and Ireland. Memon et al₈ found a trend towards an increase in the relative odds of short-term recurrence of 50% after laparoscopic repair compared with open repair. Champault et al₆ found recurrence rate of 6% in laparoscopic group versus 3% in open group in a series of 100 patients in a randomized trial. In a technology appraisal guidance 83 published by NICE₇, UK in 2004, showed recurrence rate of 2.3% after TEP repair and 1.3% after open repairs.

COMPLICATIONS

Incidence of serious visceral and vascular complications was found to be higher in laparoscopic group in most of the meta-analysis and randomized controlled trials comparing laparoscopic versus open mesh repair.

Figure 2

Table 2: Studies comparing complications between laparoscopic and open mesh repair of Inguinal Hernia

First author	Laparoscopic	Open
MC Cormack ²²	8/2315 visceral 7/2498 vascular	1/2599 visceral 5/2758 vascular
Grant ³	15 serious complications	4 serious complications
MRC trial group ⁵	5.6%	1.4%
Neumayer ⁴	39%	33.4%

Incidence of complications after laparoscopic inguinal hernia repairs can be seen in Table II. As evident from Table II, incidence of complications is significantly higher in laparoscopic group. Incidence of vascular and visceral injuries was found to be higher after laparoscopic repair (0.79% after lap repair versus 0% after open repair in NICE paper₇). IN MRC hernia trial group, all serious complications occurred in the laparoscopic group. In VA trial, complication rate was 39.1% in lap group including 2 deaths but 33.4% in open group. In an extensive review by Cochrane group₁₂ in conjunction with European Hernia trialist group, found serious vascular and visceral injuries more often in laparoscopic group (visceral injuries 8:2315 and vascular injuries 7:2498).

OPERATING TIME

Laparoscopic groin hernia repair takes longer than open mesh repair. In technology appraisal guidance 83₇, by National Institute for clinical excellence, Sept. 2004, it was stated that laparoscopic surgery was associated with a statistically significant increase in operation time compared with open methods of hernia repair. Meta-analysis of 16 randomized control trials of Trans abdominal pre peritoneal (TAPP) repair demonstrated an over all increase of 13.33 minutes compared with open repair. Metaanalysis of eight randomized control trial of trans extraperitoneal (TEP) repair demonstrated an over all increase of 7.89 minutes compared with open repair.

Memon and colleagues₈ reviewed the data from 29 published randomized clinical trials and concluded that patients who underwent laparoscopic repair of groin hernia took longer time for surgery. In a Bringman₉ trial operating time was found to be 5 minutes shorter in open mesh repair in comparison to laparoscopic group.

Comparison of operating time in various trials is shown in table III.

Figure 3

Table 3: comparing operating time

First author	Laparoscopic	Open
McCormack ²²	14.8 minute longer (p < 0.0001)	
Memon ⁸	15.2 min longer (p < 0.0001)	
MRC trial group ⁵	58.4 minute	43.3 minute
Bringman ⁹	50 minute	45 minute
Picchio ²³	49.6 minute	33.9 minute
Chung ²⁴	Laparoscopic longer in all groups	
Wright ²⁵	58 minutes	45 minutes

TIME TO RETURN TO NORMAL ACTIVITY

Majority of patients are able to perform normal activities at one week whether after open or laparoscopic_{13,14} surgery.

Data regarding time to return to activity are rather subjective. Type of employment or profession, to which patient is returning will influence how long he needs to be away from work. Patient who is doing desk job in office will return to work earlier than a patient with a job that entails heavy lifting. Some patients will be getting paid sick leave, so they will have less incentive to go back to work early₁₀. Time to return to daily activities was found to be one day shorter for laparoscopic group than those undergoing open repair of hernia in a VA hernia trial group, but the time to resumption of sexual activity was similar in the two groups. However at 3 months of follow up, there was no difference

in the activity level between the laparoscopic and open group. Lawrence et al¹¹ did not find any significant difference in return to normal activities in two groups.

COST EFFECTIVENESS

Technology appraisal paper 83 by NICE in Sept. 2004 concluded that laparoscopic groin repairs was associated with an increased cost of between 100-400 sterling pounds per procedure. Open preperitoneal method was found to be most cost effective method of open repair. Hospital stay was shortest with this method of repair. Laparoscopic hernia repair in UK has additional cost of 300 pounds over open repair, because of more operating time, time in hospital and use of specialized equipments and obligatory need for general anaesthesia¹³. The argument that the additional cost of lap hernia is offset by can earlier return of activity has been questioned¹⁵.

Figure 4

Table 4: Cost comparison

First author	Laparoscopic	Open
MRC trial group ⁵	314 more pounds	
Anderson ²¹	\$ 1091 Higher	
Jhoansson ²⁶	7063 SEK	417 SEK
Well wood ²⁷	\$ 505 more	
Heikkinen ²⁸	\$ 446 more	

A recent analysis concluded that laparoscopic repair was not cost effective in terms of cost per recurrence avoided²⁰.

LEARNING CURVE OF LAPAROSCOPIC REPAIR

Laparoscopic groin hernia repair is a more complex procedure with a steeper learning curve than open repair. It requires different skills and a familiarity with preperitoneal anatomy. Two large series concluded that 250-300 cases are required to achieve expertiser^{4,17}. This figure is hard to achieve with current surgical programmes. Jacob et al¹⁸ suggested that laparoscopic hernia repair should only be carried out in specialist centres. All most all studies have concluded that laparoscopic hernia repair should be carried out by a surgeon who has a specialized training in performing this procedure.

DAY CARE SURGERY

Open groin hernia can be performed as a day care procedure. Day surgery provides a high quality, patient-centered treatment that is safe, efficient and effective and is accompanied by a lower incidence of hospital acquired infection and early return to normal activity compared with in-patient treatment¹⁹.

POST OPERATIVE PAIN

Post Operative pain was found to be less in laparoscopic hernia repair group across the board. VA group did not find any difference in post operative pain after 14 days. Stoker et al found less post operative pain for the first 4 hours after open hernia repair probably due to effect of local anesthesia.

CONCLUSIONS

Laparoscopic hernia repair is more costly; difficult to learn with a steep learning curve, carries the risk of serious visceral and or vascular injuries. All cases of groin hernia are not suitable for laparoscopic hernia repair as it is contraindicated in strangulated hernia, sliding hernia, irreducible hernia, and patients who are elderly or have co-morbid conditions. Laparoscopic hernia repair can be not be performed as day care surgery or under local anesthesia.

Open mesh repair is economical, easy to teach and learn without any steep learning curve. Open hernia repair does not need any specialized training and results are some in both specialist and non-specialist center. Open hernia repair does not carry any risk of serious visceral or bowel injuries. Open mesh repair is suitable for all types of groin hernias including strangulated, irreducible, sliding hernia or in elderly patients and patients with co-morbidity. Open groin hernia repair is ideal for day-care surgery, especially under local anesthesia.

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Author Information

Sudhir Kumar Jain, MS, FRCS, FACS, FICS

Associate Professor, Dept. of Surgery, Maulana Azad Medical College & associated Lok Nayak Hospital

Choden Norbu, MBBS, MS

Senior House Officer, Dept. of Surgery, Maulana Azad Medical College & associated Lok Nayak Hospital