A STUDY OF MODIFIED BASSINI'S REPAIR (ANATOMICAL REPAIR) AND LICHTENSTEIN'S MESH HERNIOPLASTY

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ABSTRACT

BACKGROUND

Inguinal hernia is one of the oldest maladies known and suffered by humans. Though there are many surgical techniques which are in practice, yet there is no unison as to which is the best technique- the one with least or no recurrence rate. Our hospital being in a rural area, catering to majority of poor patients, anatomical and mesh repairs are done.

Aims and Objectives- This study is done to determine the post-operative complications of hernia during the hospital stay by two techniques.

MATERIALS AND METHODS

A prospective observational study of 100 patients admitted for inguinal hernia, who met both the inclusion and exclusion criteria were subjected to detailed examination. The post-operative complications were observed, analysed and compared with other similar studies.

RESULTS

Of the 35 patients who underwent anatomical repair (Modified Bassini's), there were 2 recurrences over a period of 2 years. There was no recurrence at all in 65 patients who underwent mesh repair (Lichtenstein's mesh hernioplasty) during the same period.

CONCLUSION

The early post-operative complications like pain, haematoma, seroma and infection rates following either surgery are comparable. However, mesh hernioplasty is superior to Modified Bassini's with regards to recurrence. The limitations of the study are relatively small number of patients studied and relatively short period of study and follow-up.

KEYWORDS

Inguinal Hernia, Groin, Herniotomy, Bassini's, Lichtenstein's, Pain, Haematoma, Seroma, Infection, Recurrence.

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BACKGROUND

The history of hernia in toto is as old as the history of surgery. Inguinal hernia, presenting as a bulge in the groin is an ancient malady, probably as old as man himself. Hernia is the "protrusion of a viscous or part of the viscous through an abnormal opening in the walls of its containing cavity." Inguinal hernias are the commonest of all the hernias and surgery is the definitive treatment for hernia.

Hernia seems to be the result of bipedal posture of humans, as a consequence of bearing of intra-abdominal pressure against the lower abdominal wall, below the level of arcuate line. This is compounded by the evolutionary defect in humans- absence of posterior rectus sheath, below the level of arcuate line.^{1,2}

Hernias have been treated since the dawn of civilisation. The earliest records of hernia are found in Egypt, dating as far back as 1500 BC. Greeks used trusses to treat inguinal hernias. The accurate description of the inguinal region in the 18th century paved the way for the development of the revolutionary surgical technique by Bassini in 1887. Since

then, many modifications of the Bassini's technique have been tried and practiced.

The study of the history of the surgical theory and technique of hernia repair points to the absence of a technique, which guarantees no recurrence. Numerous studies have been done to decide on the most suitable technique. But, there is no general agreement regarding the same.

Search for a near perfect modality of treatment of inguinal hernia has not yet ended. Recent introduction being Hernia System and Laparoscopic Repair of Inguinal Hernia. In spite of these, inguinal hernia still remains unconquered and poses a lot of challenge for all surgeons practicing hernia repairs.

Recurrence, after surgery for hernia has frustrated the surgeons for centuries. A search for a near perfect technique, which guarantees permanent cure (without recurrence) has been on for long. Controversy still exists as to which is the best technique of repair for treating inguinal hernias.³

In our institute two techniques of repair are usually undertaken-

- Modified Bassini's Repair (Anatomical Repair).
- Lichtenstein's Mesh Hernioplasty (Open Mesh Hernioplasty).

Objective

The present study has been done prospectively to determine the post-operative complications of hernia during the hospital stay by two techniques.

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Left-Sided Indirect Inguinal Hernia

Right-Sided Direct Hernia

Indirect Hernia Sac Dissected

Mesh in Place- Lichtenstein's Repair

MATERIALS AND METHODS

Source of Data

Patients admitted in the surgical wards were included in the study without bias on a serial basis. This is a prospective observational study comprising 100 patients (n= 100) of Inguinal Hernia, which was taken for convenience.

Method of Collection of Data

Inclusion Criteria

All patients coming to the surgical outpatient department with complaints of inguinal hernia.

Exclusion Criteria

Patients presenting with congenital inguinal hernia, femoral hernia, other abdominal hernias, recurrent inguinal hernias and complicated inguinal hernias, patients below 18 yrs. and above 50 yrs.

Investigations

Diagnosis was based on clinical findings. Investigations were done to assess the fitness of patients for surgery-

1. Routine blood investigations- Hb%, BT, CT.
2. Routine urine examination for Albumin, Sugar and Microscopy.
3. Fasting blood sugar, post prandial blood sugar.
4. Blood urea, Serum creatinine.
5. Electrocardiogram.
6. Chest radiography.
7. Abdominopelvic Ultrasound.⁴

If the patients were found to have any complicating medical conditions like Diabetes mellitus, Hypertension, Ischaemic heart disease and COPD, they were treated for the condition first and re-assessed for fitness for surgery. Patients were subjected to either Modified Bassini's Repair (Anatomical repair) or Lichtenstein's mesh hernioplasty (Mesh repair). All patients were given pre-operative prophylaxis with Inj. Cefotaxime 1 gm IV. Only spinal anaesthesia was administered to both the cohorts. For cohorts, classical incision was used, i.e. 2.5 cms above and parallel to the medial three-fifths of the inguinal ligament. Only sharp dissection was preferred. In case of indirect hernia, herniotomy was performed. The posterior wall repair was done by either Modified Bassini's or Lichtenstein's mesh hernioplasty. The mesh was fixed. Postoperatively, Inj. Diclofenac 75 mg IM BD was given as analgesia for 48 hours to both the cohorts. Post-operatively, Inj. Cefotaxime 1 gm IV BD was given for 48 hours to both the cohorts.^{5,6}

Postoperatively, Patients were evaluated for the Following Complications

- Pain- Treated by Inj. Tramadol IV where relevant.
- Haematoma- Evacuated when required.
- Seroma- Drained where relevant.
- Infection- Confirmed by culture and sensitivity and treated by drainage and appropriate antibiotics.

Patients were discharged when considered fit to go about their normal routine. Sutures were removed on 7th day post-operatively. Patients were followed up once a month for the first three months, once every three months, thereafter in first year and once in six months in the next year and looked for recurrence.

Statistical Analysis

The results were compared, and significance of the difference was inferred by applying and calculating according to "Chi-Square Test." Ethical clearance had been obtained from the institution for the present study.

RESULTS

The results of the study were as follows-

Age Group (Years)	Present Study (No. of Cases)	Percentage
≤ 20	4	4
21-30	30	30
31-40	14	14
41-50	52	52

Table 1. Age at Presentation

The age of the patients ranged between 18 years and 50 years. In the present study, 4% of patients were less or equal to 20 years, 30% of patients were between 21 - 30 years, 14% between 31 - 40 years and 52% between 41 - 50 years. In the study, maximum number of patients presented between 41 and 50 years of age.

Sex	Present Study	Percentage
Male	100	100
Female	00	00

Table 2. Sex

Over the period of study, only male patients presented with inguinal hernias.

Mode of Presentation	No. of Patients	Percentage
Swelling only	60	60
Swelling with pain	40	40

Table 3. Mode of Presentation

Without exception, all the patients presented with a swelling. Of these 60% of patients presented with swelling only, while 40% patients presented with both swelling and pain.

Type	No. of Cases	Percentage
Direct	36	36
Indirect	64	64

Table 4. Type of Hernia

In the present study, 36% cases were of direct type and 64% cases were of indirect type.

Graph I

Location	No. of Patients	Percentage
Right	60	60
Left	33	33
Bilateral	7	7

Table 5. Location of Hernia

In the present study 60% of cases had right-sided hernias, 33% had left-sided hernias and 7% had bilateral hernias.

Graph II

Predisposing Factors	No. of Patients	Percentage
Bladder outlet obstruction	8	8
Chronic cough	18	18
Chronic constipation	5	5
Smoking	25	25
Obese	6	6
No obvious factor	38	38

Table 6. Predisposing Factors

In the present study 8% of the patients had a history of bladder outlet obstruction, 18% had chronic cough (not due to smoking), 5% had a history of chronic constipation, 25% were smokers and 6% were obese. 38% of patients had no obvious predisposing factor.

Graph III

Duration	No. of Patients	Percentage
Less than 6 months	12	12
6 months - 12 months	50	50
More than 12 months	38	38

Table 7. Duration of Illness

Majority of the patients, i.e. 62% of patients presented and were operated within one year of the onset of the hernia. Only 38% patients presented later than a year for operation.

Graph IV

Occupation	No. of Patients	Percentage
Heavy work	55	55
Moderate work	45	45

Table 8. Relation with Occupation

The present study shows that 55% of patients were involved in heavy and strenuous work like agricultural labour, manual labour and coolie. 45% of patients were involved with moderate work like students, teachers, drivers, cooks, businessmen and vegetable vendors.

Graph V

Repair	No. of Patients	Percentage
Modified Bassini's	35	35
Lichtenstein's mesh	65	65

Table 9. Technique of Repair

In the above study, 35% of cases were treated with Bassini's repair and 67% with Lichtenstein's mesh hernioplasty. Only spinal anaesthesia was administered for surgery. In case of bilateral hernias, surgery was done on only one side.

Immediate Post-Operative Complications: Comparison

1. Pain.

Type of Repair	No. of Patients c/o Pain	No. of Patients in Each Group	Percentage
Lichtenstein's	20	65	30.76
Modified Bassini's	12	35	34.28

Table 10. Pain

$p > 0.05$ (0.7971 chi-square test)

In the present study, 30.76% of patients who had undergone Lichtenstein's mesh hernioplasty complained of pain and 34.28% of patients who had undergone Modified Bassini's repair complained of pain.

Modified Bassini's Repair c/o Pain

By applying "Chi-square" test, p-value was found to be greater than 0.05 (insignificant).⁷

2. Haematoma

Type of Repair	No. of Patients Developing Haematoma	No. of Patients in Each Group	Percentage
Lichtenstein's	5	65	7.69
Modified Bassini's	3	35	8.57

Table 11. Haematoma

$p > 0.05$ (0.808 after Yates' correction)

In our study, 7.69% and 8.57% of patients undergoing Lichtenstein's mesh repair and modified Bassini's repair developed haematoma respectively. The difference was insignificant (p-value > 0.05).

3. Seroma

Type of Repair	No. of Patients Presenting with Seroma	No. of Patients in Each Group	Percentage
Lichtenstein's	12	65	18.46
Modified Bassini's	6	35	17.14

Table 12. Seroma

$p > 0.05$ (0.891 chi-square test)

In the present study, 18.46% of patients who had undergone Lichtenstein's mesh hernioplasty developed seroma and 17.14% of patients who had undergone modified Bassini's repair developed seroma.

Here, the p-value was found to be insignificant, i.e. greater than 0.05.

4. Infection

Type of Repair	No. of Patients with Infection	No. of Patients in Each Group	Percentage
Lichtenstein's	5	65	7.67
Modified Bassini's	3	35	8.57

Table 13. Infection

$p > 0.05$ (0.086 after Yates' correction)

In the present study, 7.67% of cases who had undergone Lichtenstein's mesh hernioplasty and 8.57% of patients who had undergone modified Bassini's repair developed postoperative wound infection. P-value was insignificant ($p > 0.05$). In a study by Bholla Singh Sidhu et al, wound infection rate was 6%.^{8,9}

5. Recurrence

Type of Repair	No. of Patients with Recurrence	No. of Patients in Each Group	Percentage
Lichtenstein's	None	65	-
Modified Bassini's	2	35	5.71

Table 14. Recurrence

$p > 0.05$ (0.2499 after Yates' correction)

In the present study, there were 2 (5.71%) recurrences in patients who had undergone Modified Bassini's herniorrhaphy and none, following Lichtenstein's mesh hernioplasty.^{10,11,12,13} The p-value was found to be greater than 0.05.

6. Duration of Hospital Stay

Stay in Days	Modified Bassini's	Lichtenstein's
Ave. hospital stay	5.6 days	4.8 days
≤ 7 days	29 (82.85%)	55 (84.61%)
> 7 days	6 (17.14%)	10 (15.38%)

Table 15. Average Number of Days of Hospital Stay

In the present study, patients who had undergone Modified Bassini's repair had on an average stayed for 5.6 days in the hospital as compared to 4.8 days following Lichtenstein's mesh repair. Following Bassini's repair, 6 cases stayed beyond 7 days accounting for 17.14% of cases, while following Lichtenstein's mesh repair 10 cases (23.08%) stayed for more than 7 days.

Graph VI. Bar Diagram Comparing Postoperative Complications of Lichtenstein's and Modified Bassini's Repairs

DISCUSSION

The study shows that they are at the disposal of a surgeon, a plethora of techniques for the repair of inguinal hernias. In the light of this, it becomes relevant to study the advantages and disadvantages of various techniques and decide which technique is statistically superior and suitable to patients coming to our institute. Traditionally, modified Bassini's repair was the most popular repair technique.

Advances in the understanding of the pathophysiology of recurrence have led to the conclusion that in this technique tissues are approximated under tension. This is a cardinal, if not the most important factor in the failure of the hernia repair. Tissues approximated under tension tend to pull apart, but are prevented by the sutures. An area of ischaemic

necrosis develops near the point of contact between sutures and tissues. This process of ischaemic necrosis proceeds until tissues have returned to their original position and hernia recurs through the consequent gap. This is more so in case of recurrent hernia, where tissues have been distorted by previous surgery. Lichtenstein, Bendavid, Gilbert and Rutkow mesh repairs are all based on absolute tensionlessness.

The other short-term complications following modified Bassini's repair and prolene mesh hernioplasty need to be studied, as higher incidence of complications may outweigh the lower recurrence rates. Results published worldwide vouch for the superior results of mesh repair over that of conventional tissue repair like the one given by Bendavid after a review of literature.

CONCLUSION

In the present study, 35 patients with inguinal hernia who had undergone modified Bassini's repair were compared with 65 patients with inguinal hernia who had undergone Lichtenstein's mesh hernioplasty. After analysing the data and observations, the following are the conclusions from the present study-

- The age of the patients ranged between 18 years and 55 years. Maximum number of patients presented between 41 and 50 years of age.
- Male are predominantly affected with inguinal hernias.
- Swelling only was the predominant presentation in most of the patients, whereas 40% patients presented with both swelling and pain.
- Incidence of Indirect hernias was almost twice than that of direct hernias.
- Right-sided hernias are the commonest followed by left-sided hernias. Bilateral hernias were few in number.
- More than half of the patients had some predisposing factors like bladder outlet obstruction, chronic cough, chronic constipation or strenuous work. Rest had no obvious predisposing factor.
- Most of the patients presented and were operated within one year of the onset of the hernia.
- Post-operative pain was almost the same following either surgery, but patient undergoing mesh repair had pain of less intensity.
- Post-operative haematoma occurrence was almost of same magnitude following either surgery.
- Occurrence of seroma following mesh repair was slightly more than following Bassini's repair.
- Post-operative wound infection was slightly more following mesh repair than following Bassini's repair.
- The average duration of hospital stay in patients who had undergone modified Bassini's repair was slightly longer than following Lichtenstein's mesh hernioplasty.
- There were no recurrences in patients who had undergone Lichtenstein's mesh hernioplasty and 2 (5.71%) recurrences in patients who had undergone modified Bassini's repair over the period of study. Though the present comparative study does not show any distinct advantages of one repair over the other, Lichtenstein's mesh hernioplasty gives superior results compared to modified Bassini's repair with regards to

recurrence. However, the sample size and the follow up period in the current study being relatively short, a larger study sample and a longer follow-up study may be needed before any further conclusions can be made.

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