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Original Research Article

A comparative study of intra operative parameters of darning and mesh repair in inguinal hernia

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ABSTRACT

Background: Inguinal hernias are protrusions of abdominal cavity contents through the inguinal canal. Inguinal hernias are the commonest of all hernias and adult inguinal herniorrhaphy accounts for 15% of operations in general surgery. Surgery is the definitive treatment for the hernia. If hernias are not operated, often they go for complications and increase the morbidity and mortality. The objectives of the study were to compare intra operative parameters of darning and mesh repair in inguinal hernia.
Methods: This prospective controlled study was conducted in 50 patients presenting with inguinal hernia. The 50 patients were randomly allocated into two groups. Group A consists of 25 patients who underwent darning and Group B of 25 patients who underwent Lichtenstein mesh repair. Detailed history, thorough general, local and relevant systemic examination was carried out with all necessary investigations. After obtaining informed consent patients were subjected to surgery. Various intra-operative and post-operative parameters were noted. Patients were followed post-operatively closely to note the complications. Data was entered and analyzed using chi square test. P value of less than 0.05 was considered significant.
Results: The incidence of inguinal hernia was more in patients with Strenuous work as it accounted for 14 i.e. 46.6% of the patients with precipitating factors and 28% of the study sample. All patients presented with swelling and only 38% of the patients presented with swelling with pain. Both the groups were compared for post-operative pain and post-operative complications and it was found that there was no significant difference among the two groups. But cost wise, the darn repair technique is more cost effective than mesh repair.
Conclusions: The present study revealed that the cost effectiveness of darning for inguinal hernia as the cost of darning is almost half of mesh repair with similar results.

Keywords: Inguinal hernia, Mesh repair, Darning

INTRODUCTION

Hernia term is derived from the Latin word for rupture. It is defined as an abnormal protrusion of an organ or tissue through a defect in its containing walls. Although a hernia can occur at various sites of the body, these defects most commonly involve the abdominal wall, particularly the inguinal region. Abdominal wall hernias occur only at sites where the aponeurosis and fascia are not covered by striated muscle.[1]

Inguinal hernias are protrusions of abdominal cavity contents through the inguinal canal. Inguinal hernias are the commonest of all hernias and adult inguinal

herniorrhaphy accounts for 15% of operations in general surgery. Surgery is the definitive treatment for the hernia. If hernias are not operated, often they go for complications and increase the morbidity and mortality.[2]

The success of hernia repair depends on its ability to prevent recurrence. Factors, which can result in failure, repair under tension, deficient tissues, inadequate hernioplasty and overlooked hernias. There present new successful repairs like tension free Lichtenstein repair, suture less technique of Gilbert and mesh plug hernioplasty of Rutkow are based on the absolute absence of tension and with good results.[3]

Darn repairs were first introduced in the early 20th century to reduce tissue tension by using either autologous tissue or synthetic suture to bridge the gap between fascial tissues. Muscle and fascial flaps were attempted without consistent success. In 1918, Handley introduced the first use of silk as a prosthetic darn and nylon followed by several years later. However, it was found that heavy prosthetic material increased the risk of wound infection and the silk suture ultimately lost its strength over time.[4]

The darn repair method described by Moloney, has provided a new insight to the surgery of inguinal hernia. The recurrence rates are also comparable. Moloney achieved recurrence rates as low as 0.8% with an inguinal darning repair. Abrhamson was the first to point out the defects that could lead to high recurrence rates in darn repair. His series of more than 1000 repairs reported in 1995 recorded recurrence rates as low as 0.8%. Recently Omer Farooq in 2005 reported 0.6% recurrence rate with darn repair. Also the cost of darn repair was significantly less due to the non-requirement of prosthetic material which is comparable with Lichtenstein tensionless mesh repair, the widely accepted procedure where the cost of the mesh is the main constraint to the poor people.[5]

In the present study, darning and Lichtenstein mesh repair techniques are compared in repair of inguinal hernia. The reasons for choosing this topic are multifold. First of all, inguinal hernia cases are very commonly seen. Lichtenstein mesh repair is routinely carried out in our hospital for inguinal hernia cases. However, most of the patient population is from the poor background, for which they are very much hesitant to afford the polypropylene mesh for Lichtenstein mesh repair. There are inconclusive and insufficient data available for darn repair in this part of the country. In order to give a better alternative in the form of darn repair, which is usually cheaper as compared to the conventional mesh repair, it was felt to conduct a study to compare the suitability of darn repair vis a mesh repair, so that in future darn repair can be considered as an alternative procedure for the patients who cannot afford the cost of a mesh repair in inguinal hernias.

METHODS

This prospective controlled study was conducted in 50 patients presenting with inguinal hernia and were randomized to undergo hernia repair either by darning or Lichtenstein mesh repair. The patients included in the study were selected from Mamata General Hospital, Khammam, Telangana. The study was conducted from August 2012 to September 2014 after obtaining ethical clearance from Ethics Clearance Committee.

The 50 patients were randomly allocated into two groups. Group A consists of 25 patients who underwent darning and Group B of 25 patients who underwent Lichtenstein mesh repair.

Inclusion criteria

- Patients with primary uncomplicated inguinal hernia
- Age more than 20 years
- Patients willing to be included in the study

Exclusion criteria

- All cases of complicated inguinal hernia
- Age less than 20 years
- All cases of recurrent inguinal hernias
- Patients not willing for the study

Investigation protocol

Detailed history, thorough general, local and relevant systemic examination was carried out with all necessary investigations. After obtaining informed consent patients were subjected to surgery. Various intra-operative and post-operative parameters were noted. Patients were followed post-operatively closely to note the complications.

Data was entered and analyzed using chi square test. P value of less than 0.05 was considered significant.

RESULTS

Table 1: Number of patients with various precipitating factors.

Precipitating factors	Mesh repair		Darning	
	No.	%	No.	%
Benign prostate hypertrophy	01	3.3	01	3.3
COPD	01	3.3	00	00
Constipation	04	13.33	02	6.66
Strenuous work	06	20	08	26.66
BPH and Strenuous work	01	3.3	01	3.3
COPD strenuous work	00	00	01	3.3
Constipation and Strenuous work	03	10	01	3.3

The incidence of inguinal hernia was more in patients with Strenuous work as it accounted for 14 i.e. 46.6% of the patients with precipitating factors and 28% of the study sample.

Table 2: Mode of presentation.

Mode of presentation	No.	%
Swelling	50	100
Swelling with pain	19	38

All patients presented with swelling and only 38% of the patients presented with swelling with pain.

Table 3: Laterality of inguinal hernia.

Laterality	Direct hernia		Indirect hernia	
	No.	%	No.	%
Bilateral	10	20	32	64
Unilateral	05	10	03	06

Maximum cases were having bilateral hernia in both the types i.e. direct as well indirect hernia. Few patients presented with unilateral hernia.

Table 4: Grading of pain at 24 hours.

Pain grading	Mesh repair		Darn repair		P value
	No.	%	No.	%	
Mild	05	20	06	24	0.732
Moderate	12	48	10	40	0.301
Severe	08	32	09	36	0.765

The pain at 24 hours post-operatively experienced by patients was similar in both the groups and there was no statistically significant difference among the two groups across all grades of pain.

Table 5: Grading of pain at 72 hours.

Pain grading	Mesh repair		Darn repair		P value
	No.	%	No.	%	
Mild	16	64	14	56	0.772
Moderate	05	20	07	28	0.740
Severe	02	08	03	12	0.637

Table 6: Post-operative complications.

Post operative complications	Mesh repair		Darn repair		P value
	No.	%	No.	%	
Seroma	04	20	06	30	0.7237
Surgical site infection	04	20	03	15	1.00
Wound gaping	02	10	03	15	1.00

The pain at 72 hours post-operatively experienced by patients was similar in both the groups and there was no statistically significant difference among the two groups across all grades of pain.

Post operative complications in both the groups were comparable. There was no statistically significant difference among the two groups.

Table 7: Comparison of cost in Indian Rupees (INR) for both procedures.

Item	Cost of mesh repair	Cost of darn repair
Investigations	600	600
Suture material	150	150
Mesh	1500	Not required
Antibiotics	210	210
Total cost	2460	960

It can be seen clearly from above table that darn repair is the most cost effective technique of inguinal hernia as compared to mesh repair.

DISCUSSION

In the present study we found that strenuous work was the most common precipitating factor for inguinal hernia. Liem MSL et al also reported similar findings.[6] They reported that 24% of their patients were doing strenuous work. This may be due to the fact that most of the rural population is involved in agricultural work.

The unfortunate evolutionary defect in humans is the absence of posterior rectus sheath below the arcuate line and only a rather insubstantial transversalis fascia, unsupported by muscle or aponeurosis, resisting the intra-abdominal pressure and holding the breach between the abdomen and thigh is compounded by humans having adopted the upright posture and changed from quadrupedal and bipedal location. It is believed that this change has opened up and stretched the groin region and brought about alterations in the functional efficacy of the shutter mechanism which led to greater propensity to develop inguinal hernia.[7]

We found that indirect inguinal hernia cases had more of unilateral presentation in 64% of cases, whereas direct inguinal hernia had mainly bilateral presentation (20%). Nasir Ali et al observed similar findings consistent with the present study.[8] They also found that indirect inguinal hernia presented mainly as unilateral in 61.53% of cases and in direct hernia bilateral presentation was more common.

We noted that darning was more time taking procedure compared to mesh repair. It was 65 minutes for darning compared to only 45 minutes for mesh repair. Similar findings were reported by Bhushan TV et al, Moloney et

al, Thapar V et al.[9-11] Ankit Mohan Das et al who observed a mean time of 44.9 minutes for darning compared to 39.6 minutes for mesh repair.[12]

In the present study, it was observed that there was no significant difference between the two procedures with regard to post-operative pain at 24 and 72 hours (p >0.05). Koukourou et al found that moderate pain was present in 19 and 18 cases of mesh and darn repair respectively at 24 hours.[13] They also reported that number of cases with mild pain were 24 and 22 in mesh and darn repair respectively at 72 hours. Thus their findings are consistent with the findings of the present study.

In the present study we observed that seroma was the most frequent post-operative complication with 30% in darn repair and 20% in mesh repair. Nisar et al reported it as 3.15% and 3.63% in darn and mesh repair respectively.[8] These are comparable with the present study.

We found that wound infection was present in 15% of cases who underwent darn repair and 20% of mesh repair cases with no statistical significant difference. Bhushan TV et al reported wound infection in 12% cases of mesh repair and 6% cases of darn repair.[9] Nisar et al noted wound infection in 2.42% of cases of mesh repair and 3.15% of cases of darn repair.[8] Mohammad Nasir et al found this in 1.55% of cases.[14] Zedan AM et al observed that the wound infection rate as 22.9% in darn repair and 8.3% in mesh repair.[15]

In the present study no patient suffered from post-operative complication of hematoma. Zedan AM et al reported the incidence of hematoma as 12.5% in darn repair and 8.3% in mesh repair.[15] Ankit Mohan Das et al observed it as 6.7% in darn and mesh repair.[12]

We did not find any recurrence of inguinal hernia in the present study. Similar findings were reported by Bhushan TV et al, Ankit Mohan Das et al, and Zedan AM et al.[9,12,15]

CONCLUSION

The present study revealed that the cost effectiveness of darning for inguinal hernia as the cost of darning is almost half of mesh repair with similar results.

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