

## Open Mesh versus Non-Mesh Repair of Inguinal Hernia

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### Abstract

**Background;** The repair of inguinal hernia carries considerable risk of recurrence in spite of the large number of studies there is no agreement on best surgical technique.

**Objective:** To compare the outcome of inguinal hernia repair using mesh, and non mesh technique and to find the most suitable method of repairing.

**Patients and Methods;** A study of 76 patients used to evaluate open inguinal hernia repair divided into 2 groups treated by mesh and non mesh technique during the period from April2005-October2009.

**Results;** 76 patients divided into 2 groups, Group A; Forty patients treated by mesh repair, 95% males, 5% females, mean age 46 years. Indirect hernia 85% of the patients, 12.5% direct hernia, and 2.5% sliding hernia, postoperative complications; seroma(2.5%),superficial wound infection(5%),deep infection(7.5%),urinary retention(2.5%), scrotal swelling(5%),pain more than 3 days(5%),no testicular atrophy and recurrence. Group B; 36 patients treated by non mesh repair, 86% males, 14% females, mean age 50 years. Indirect hernia 83.35%, 11.15% direct hernias, and 5.5% sliding hernia, postoperative complications; seroma (5.5%), superficial wound infection (11%), deep infection (2.7%), urinary retention (5.5%),scrotal swelling(11%), pain more than 3 days(13.8%),testicular atrophy(2.7%),and recurrence(2.7%).

**Conclusion;** the mesh repair was found to be superior to the non mesh in treating inguinal hernia.

**Keywords:** Inguinal hernia, open mesh, non mesh repair, complications.

### Introduction

Since the mid 1980s, dramatic progress has been made in the evolution of hernia surgery; Firstly because of the increase use of prosthetic mesh, secondly because the repair of groin hernias now become the most common operation performed by a general surgeon, Improvements in surgical technique have significantly improved outcomes for many patients.<sup>[1]</sup>

Traditional hernia repair "tissue repair" described by Bassini "1880" emphasized the importance of reconstitution of transversals' facial layer of posterior wall of inguinal canal. He used interrupted silk suture in approximating of conjoint tendon to inguinal ligament, McVay 1910 popularized the use of Cooper ligament which is approximated to the conjoint tendon, multilayer repair was described by Shouldice 1953.

Some surgeons thought for re-enforcement of posterior wall of inguinal canal using either biological or synthetic material "Darning", among earliest darning was McArther 1901 who used strip of external oblique aponeurosis as woven between conjoint tendon and inguinal ligament, while among those who used synthetic material Oglive 1937 who use "silk lattice repair" until Moloney 1948 introduced modern nylon darn and this method became popular because of simplicity.<sup>[2]</sup>

Other surgeons seek the use of patch in repair of inguinal hernia using biological material as fascia lata, pericardium, periosteum,<sup>[3]</sup> then surgeons starting to use prosthetic material, McGavin 1909 used silver wire, tantalum, gauze and stainless steel wire but this material cause post operative pain, fragmentation, migration, infection, sinus formation and difficulty in removing it, so the use of metal prostheses has largely been abandoned. Plastic prostheses used such as Nylon, Silastic, and Teflon but with unsatisfactory result, now with nearly 50 year of continuous use of prosthetics it has become clear that the use of modern prostheses is safe and

effective. The material that has emerged as suitable for routine use in hernia surgery include polypropylene (monofilament prolene or poly filament) Dacron and polytetrafluoroethylene (PTFE).<sup>[4]</sup>

Lichtenstein (1986) introduced the repair of primary inguinal hernia using synthetic mesh. Rutkow produce his innovate open mesh plug hernioplasty.<sup>[5]</sup>

River and Stoppa introduced preperitoneal approach in placing of prosthetic mesh, it used specially in bilateral and recurrent hernia.<sup>[6]</sup>

### Patients and method:-

Seventy six patients with inguinal hernia admitted at Al-Yarmouk Teaching Hospital and Al-Mussayb General Hospital in a period between April 2005 – October2009 were used to evaluate two methods of open repair of inguinal hernia: mesh technique and non-mesh technique, Sixty nine of them were males,7 females with a ratio of 9.9;1. Forty patients with mesh representing (group A) and 36 patients with non-mesh\* repair (group B). Post operative follow-up after 2 weeks, 4 weeks, 6 months, 12 months and 2 years was documented. The items for comparison were; post operative pain, early and late complications, and recurrence. All patients had full history, physical examination, blood investigations, ECG for patients above forty, and chest X-ray. General anesthesia used in "51" patients, and "25" patients by spinal anesthesia, supine position, antibiotics and analgesia were given to all patients post operatively.

### Surgical Technique:

#### Group A;

Through Para inguinal incision, the inguinal canal was opened, after dealing with hernia sac, the posterior wall is covered by polypropylene mesh secured into position with prolene 2-0 interrupted sutures to the inguinal ligament and conjoined

tendon. A slit in the mesh at the internal ring surround the spermatic cord at the deep inguinal ring sutured superiorly, Wound closed in layers.

**Group B;**

Herniorrhaphy (modified Bassini or Darning) done to re-enforce the posterior wall by 2-0 continuous nylon suturing.

The two groups were assigned according to the availability of mesh at time of surgery.

**Results:**

*Age;*

**Group A;** 38 male and 2 female median age 46 years, age range (16-76 years), as in Table 1.

**Group B;** 31 male and 5 female median age 50 years, age range (26-75 years), as in Table 1.

*Past history;*

**Group A;** one patient had cardiovascular problems, 2 patients had respiratory diseases.

**Group B;** 2 patients had cardiovascular problems, 3 patients had respiratory diseases, one patient had diabetes.

**Hernia type;**

**Group A;** 34 indirect inguinal hernias, 5 direct and one sliding.

**Group B;** 30 indirect inguinal hernias, 4 direct and 2 sliding, (Table 2).

*Post operative complications;*

**Group A;** seroma one (2.5%), superficial wound infection 2 (5%), deep infection 3(7.5%), urinary retention one (2.5%), pain more than 3 days 2(5%) that requires analgesia like Tramadol 100 mg, scrotal swelling 2(5%), as in Table 3.

**Group B;** seroma 2(5.5%), superficial wound infection 4 (11%), deep infection one (2.7%), urinary retention 2(5.5%), pain more than 3 days 5(13.8%), scrotal swelling 4(11%), as in Table 3.

*Late complications:*

**Group A;** Prolong groin pain one (2.5%), No Testicular atrophy, No recurrence.

**Group B;** Prolong groin pain 3(8.3%), Testicular atrophy one (2.7%), recurrence one (2.7%).

**Table (1): Sex of patients**

Patients	Group A	Group B
Total Number	40(52.6%)	36(47.3%)
Male	38(95%)	31(86%)
Female	2(5%)	5(14%)

**Table (2): Hernia characteristics**

Hernia characteristics	Group A	Group B
Indirect Hernia	34(85%)	30(83.35%)
Direct Hernia	5(12.5%)	4(11.15%)
Sliding Hernia	1(2.5%)	2(5.5%)

**Table (3): Early and late post operative complications.**

complications		Group A	Group B
Early	seroma	1 (2.5%)	2 (5.5%)
	Superficial infection	2 (5%)	4 (11%)
	Deep infection	3 (7.5%)	1 (2.7%)
	Urinary retention	1 (2.5%)	2 (5.5%)
	Pain more than 3 days	2 (5%)	5 (13.8%)
	Scrotal swelling	2 (5%)	4 (11%)
Late	Prolong pain	1 (2.5%)	3 (8.3%)
	Testicular atrophy	0	1 (2.7%)
	Recurrence	0	1 (2.7%)

Chi-Sq = ( $\chi^2 = 8.759$ ), DF= 1, P-Value = 0.003) that is statistically significant (The mesh repair was found to be superior to the non mesh).

**Discussion:**

This study demonstrated that tension-free mesh repair of inguinal hernia offer a significant benefit over non mesh repair in the major outcome measures of preventing future recurrence, chronic pain, testicular atrophy, reducing postoperative pain, and the incidence of superficial wound infections.

In our study superficial wound infection occur in 2 patients (5%) in group A, and 4 patients (11%) in group B; it was in the form of redness and serous fluid discharge that did not lead to removal of mesh. the results of similar study done by Scott et. al. On 5016 participants showed that the rate of infection is more with non mesh repairs, 1% in mesh repair, and 6% in non mesh,<sup>[7]</sup> which is less than our study.

Scrotal swelling develops in 2 patients (5%) in group A: and 4 patients (11%) in group B: treated conservatively. Study done by Bellone (1999) reported scrotal swelling following mesh repair was 4%,<sup>[8]</sup> which is less than our study.

Both methods developed post operative seroma, one patient (2.5%) in Group A: and 2 patients (5.5%) in Group B. study done by Arshad M Malik 2009

revealed that 1 % of patients have seroma following mesh repair<sup>[9]</sup>, which is less than our results.

Post operative pain, Group A: patients had less requirements for post operative analgesia like Tramadol 100 mg, 2 patients (5%) when compared to Group B: 5 patients (13%). A study done by Kristin and Masukawa 2010 shows that 1% and 4% respectively,<sup>[10]</sup> which is less than our results.

There is no testicular atrophy in Group A: and one patient (2.7%) in Group B; study done by Mourad Hilmi 2004 show 0%,9% respectively,<sup>[11]</sup> which similar to our study in mesh group and higher in non mesh group.

The incidence of recurrence in Group A; was zero and 2.7% in Group B. a study done by Othman A. Salim 2008 show no recurrence for mesh group and 6% for non mesh group,<sup>[12]</sup> which similar to our study in mesh group and higher in non mesh group.

**Conclusion:**

There is no doubt that mesh repair yield low recurrence rates, less postoperative complications.

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