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Original Research Article

Comparison of progrip mesh v/s conventional mesh in lichtenstein's inguinal hernia repair

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Abstract

Introduction: Inguinal hernia is a very common disease. It is estimated that at least 5% of the population will develop a groin hernia in their lifetime, making groin hernia repair one of the most common operations performed by general surgeons. The only way to treat inguinal hernia is surgery.
Aim: The aim of our study is to compare the outcome after Lichtenstein's inguinal hernia repair using conventional mesh v/s self-fixating Progrip mesh. The primary endpoint of the study will be the incidence of post-operative pain
Objectives: 1) To compare the outcome in terms of operative time. 2) To compare possibility of complications. 3) To compare postoperative pain.
Conclusion: Lichtenstein's inguinal hernia repair using self-fixating Progrip mesh has an advantage over conventional mesh in terms of less operative time and post-operative pain.
Keywords: inguinal hernia, progrip mesh, conventional mesh.

1. Introduction

Inguinal hernia most probably has been a disease ever since mankind existed. It occurs in different kind of animals, particularly primates; even prehistoric human beings were affected with the disease. The surgical history of inguinal hernias dates back to ancient Egypt. From Bassini's heralding of the modern era to today's mesh-based open and laparoscopic repairs, this history parallels closely the evolution in anatomical understanding and development of the techniques of general surgery [9]. Accounting for 75% of all abdominal wall hernias, and with a lifetime risk of 27% in men and 3% in women, inguinal hernia repair is one of the most commonly performed surgeries in the world [10]. In the US, inguinal herniorrhaphy accounts for approximately 8,00,000 cases yearly[11].

It is estimated that of all hernias, 66% are indirect and 33% direct [12]. Hernias are typically repaired through a surgical procedure called herniorrhaphy, in which the surgeon repairs the hole in the abdominal wall by sewing surrounding muscle together or by placing a patch called "mesh" over the defect. Most surgeons make an incision at the site of the hernia in order to gain access to the defect, although some surgeons prefer to do these procedures laparoscopically. During a laparoscopic hernia repair, the surgeon makes very small incisions to pass through specialized instruments and an endoscope, a device that allows the surgeon to see the abdominal area without opening the patient up. Laparoscopic hernia repair generally results in less postoperative pain and recovery time than open surgery. Current inguinal hernia operations are generally based on anatomical considerations. Failures of such operations are due to lack of consideration of physiological aspects. Many patients with inguinal hernia are cured as a result of current techniques of operation, though factors that are said to prevent hernia formation are not restored. Therefore, the surgical physiology of inguinal canal needs to be reconsidered.

A physiologically dynamic and strong posterior inguinal wall and the shielding and compression action of the muscles and aponeuroses around the inguinal canal are important factors that prevent hernia formation or hernia reccurence after repair. In addition, the squeezing and plugging action of the cremasteric muscle and binding effect of the strong cremasteric fascia, also play an important role in the prevention of hernia. Inguinal hernia repair still remains a problem because of -1) The high recurrence rates seen in the hands of the junior surgeons; 2) risky dissection of the inguinal floor in the

Bassini/Shouldice repair and 3) infection and chronic groin pain following mesh repair.

The successful management of any problem depends on the understanding of its patho-physiology. In this context, some questions related to the physiology of the inguinal canal or factors that prevent herniation still exist. Lateral and cephalad displacement of the internal ring beneath the transversus abdominis muscle and approximation of the crura results in a shutter mechanism at the internal ring [13]. When the arcuate fibers of the internal oblique and transversus abdominis muscle contract, they straighten out and move closer to the inguinal ligament (shutter mechanism) at the inguinal canal[14,15].

This opposite movement (upward & downward) of the same muscle needs proper explanation. The term "Obliquity of the inguinal canal" is not a perfect description since the spermatic cord is lying throughout its course on the transversalis fascia. Repeated acts of crying, thereby increasing the intra-abdominal pressure do not increase the incidence of hernia in new born babies inspite of the almost absent "obliquity of the inguinal canal" or "shutter mechanism". Similarly, every individual with a high arch or a patent processus vaginalis does not develop hernia [16]. Factors that are said to prevent herniation are not restored in the traditional techniques of inguinal hernia repair and yet 70-98% of patients are cured. Inguinal hernia repair is one of the most common performed surgical procedures. Inguinal hernia repair is associated with long term risks of pain and discomfort. In 1996 Cunningham *et al* were the first to report a pain incidence of 63% after one year [17].

Five years later, in a large cross sectional cohort study the rate of chronic pain was 29%. This complication was associated with functional impairment in more than half of those with pain [18]. Chronic pain accounted for restriction in daily activities in up to quarter of patients [19]. In an updated review the risk of a chronic pain state with clinically significant effects on daily activities was about 12%[20]. The foreign body response to meshes resulted in axonal edema, loss of myelinated axons, peri and endoneuronal edema and subsequently pain [21].

Pain may also be dependent on the method of fixation. Sutures may cause ischaemia, muscle contraction or nerve damage resulting in pain. This is corroborated by the fact that removal of sutures can be effective treatment in patients with pain [22]. There are several techniques for mesh implantation, but most involve sutures to anchor a mesh in position and prevent migration, wrinkling and curling. Sutures that anchor the mesh are blamed for extensive tissue tension and nerve entrapment leading to prolonged post-operative pain. Even the application of absorbable sutures instead of non-absorbable ones does not solve the problem. Chronic groin pain following inguinal hernia repair is a significant, though under-reported problem. Complications associated with sutured fixation of the mesh have prompted surgeons to use atraumatic fixation using substances such as human fibrin glue. These adhesives have shown reduced incidence of chronic groin pain, foreign body sensation and groin numbness in both randomised trials and observational studies [23]. Avoiding chronic groin pain should be a prime goal for any hernia surgeon, considering that 5-7% of patients with post-herniorrhaphy groin pain will sue their surgeons [24]. Practice of surgery has marched from being merely life and limb preserving to being enhancer of post-operative quality of life. Patient reported outcomes have always taken precedence over clinical outcomes and this has encouraged surgeons to innovate [25].

Introduction of polypropylene prosthesis by Francis Usher brought an era of progressively decreasing recurrence rates. Success with polypropylene meshes is associated with formation of mesh aponeurosis scar tissue complex. Inflammatory response induced by polypropylene is integral to mesh aponeurosis scar tissue complex formation, but continuation of inflammation beyond this complex has raised many concerns. Markers of inflammation continue to play around for years in the polypropylene implanted tissues around inguinal region [26].

Severe chronic pain has significant effects on return to work and quality of Keith A[27]. These effects can persist for several years after hernia repair and are associated with significant healthcare costs.

The new progrip mesh is self-retaining, moves in harmony with the inguinal structures and so is compliant with the structures of the groin. It is 100% fixation free, promotes the regeneration of healthy tissue inside its structure [7] and shows low rate of complications [8]. The present study is aimed to study the usefulness of the progrip mesh in reducing the incidence of chronic groin pain after inguinal hernia repair.

2. Material and Methods

This prospective study was conducted between August 2016 and August 2016 on patients with inguinal hernias admitted to S.B.K.S. & M.I.RC. Dhiraj Hospital Piparia Vadodara.

2.1 Inclusion criteria

All Patients Undergoing Lichtenstein's Inguinal hernia repair in surgery department.

2.2 Exclusion criteria

1. Patient not willing for study.
2. Paediatric Patients will be excluded

2.3 Method of collection of data

All the patient undergoing Lichtenstein's Inguinal

hernia repair were enrolled in study and details of them was taken. Written and Informed Consent was obtained for taking part in study and for operative procedure. Patient's history and examination was done in details.

Patient were randomly divided into two groups A and B. Group A patient had undergoing Lichtenstein's repair with self -fixating progrip mesh and Group B had undergoing Lichtenstein's repair with conventional mesh. Time period in each group will be noted. Post -operative pain were noted according to pain score and at follow up.

Patients were followed up after discharge on 15th day.

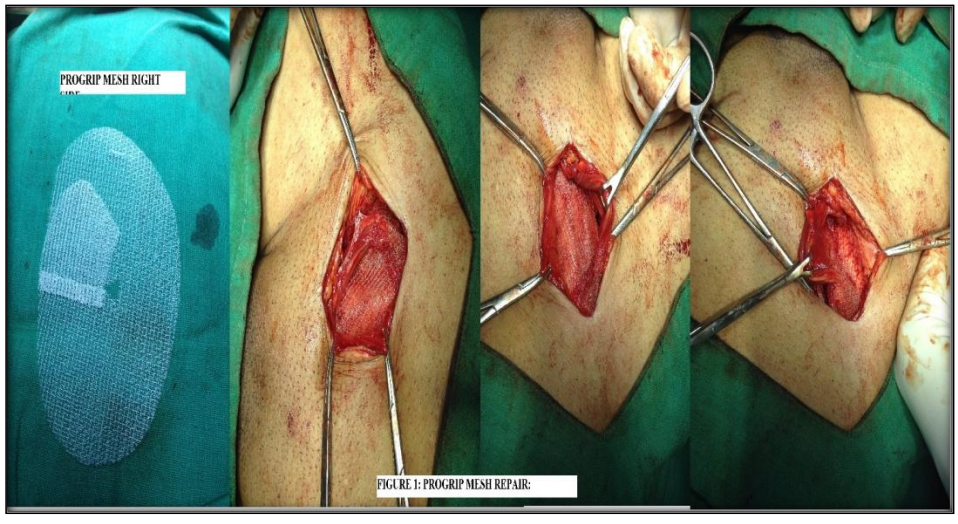

Figure 1: Progrip mesh Repair

3. Results and Discussion

20 patients in each group were enrolled in our study.

3.1 Age Incidence

Mean age in our study was 45.5 years ranging from 25-68 years.

3.2 Comparison of operative time

Operative time for Lichtenstein's Inguinal hernia repair using conventional mesh was 35.5 min (average) while using self-fixating progrip mesh was 20.5 min (average).

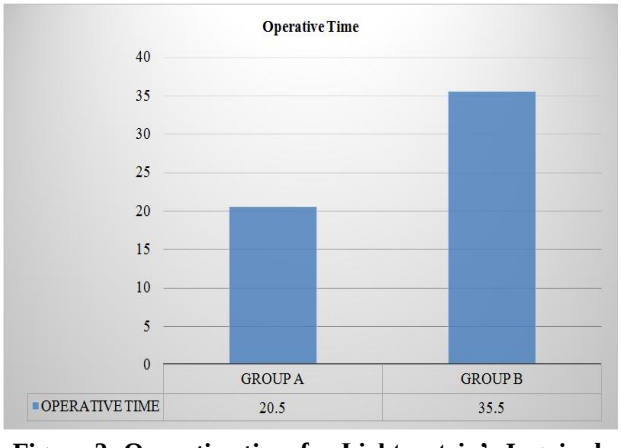

Figure 2: Operative time for Lichtenstein's Inguinal hernia repair using conventional mesh was 35.5 min

3.3 Comparison of Post-operative pain

Post-operative pain is now considered the most frequent and disabling complication of hernia repair [2]. In our study post-operative pain was less in group A compared to Group B.

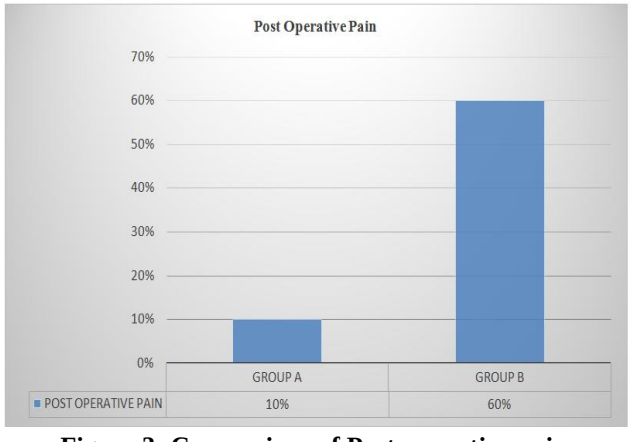

Figure 3: Comparison of Post-operative pain

According to the International Association for the study of pain (IASP) Post herniorrhaphy chronic groin pain is defined as groin pain reported by patient at or beyond 3 months following inguinal hernia repair [3]. Severe chronic pain is a serious long-term problem that may occur after groin hernia repair [4]. Population based studies and randomized clinical trials indicate that around 30 percent of patients have some form of pain and 3 percent report severe pain at 1 year after hernia repair [5,6]. The reason for such pain is not clear, but factors such as nerve injury, tissue injury and use of biomaterials have all been implicated [4]. There is a consensus that tension-free repair is the gold standard in inguinal hernia

surgery because of higher patient comfort and lower recurrence rates [1].

Among the several tension-free techniques, the Lichtenstein's method has gained remarkable popularity due to its advantages of easy-to-perform, better patient comfort and less tissue dissection [2]. Because of the fact that the rate of chronic pain is higher than the rate of recurrence after open inguinal hernia repair, the tension-free inguinal hernia repair introduces questions concerning the long-term safety of implantation of mesh material, especially the risk of chronic pain[3]. Different studies reported the rate of prolonged pain after hernia surgery from 9.7% to 51.6%[4–6]; furthermore, the incidence of persistent postoperative inguinal pain that interferes with daily activities is reported to be as high as 6%[7,8].

Meanwhile such chronic pain can be disabling, and in half of the cases, it leads to depression and time off from work, with job loss as an ultimate result in one-fourth of patients [8]. The reason for such pain is unclear; mesh material, its structure and interaction with tissue, as well as scarring, nerve damage, or entrapment by fixation sutures have all been suggested as possible causes. Because of these facts, fixation of the mesh during operation continues to be a focus of interest. Different fixation procedures have already been investigated to determine whether and to which extended fixation of mesh is a source of acute and chronic pain [9].

A new self-gripping mesh (Parietene Progrip) has been developed; this self-gripping mesh is made of lightweight isoelastic large-pore knitted monofilament polypropylene fabric that incorporates resorbable microgrips to provide self-gripping fixation during the first few months after implantation [10].

The microgrips are clubshaped 1-mm projections that are made of biodegradable polylactic acid. The microgrips integrate into the tissue for 0.5 mm below the lower rim of the mesh and provide stronger tissue incorporation at 5 days than fixation with staples [11]. Fixation is, therefore, greatly facilitated without the requirement for sutures that can penetrate underlying tissues and damage cutaneous nerves. The objective of this study was to compare the results of inguinal hernia repair between the self-gripping meshes and conventional sutured Lichtenstein meshes, with the chronic pain as the main endpoint, and with other postoperative complications as secondary.

4. Conclusion

Lichtenstein's inguinal hernia repair using self-fixating Progrip mesh has an advantage over conventional mesh in terms of less operative time and post-operative pain

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