


Research Article

Our experience in using self-gripping mesh during Liechtenstein repair. Randomized control trail

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Abstract

Inguinal hernioplasty is among the most operated surgical procedures globally, where Lichtenstein anterior hernioplasty is considered the gold standard repair. Modifications aiming at improving the outcomes of Lichtenstein regarding-operative time and post-operative pain include using Self-gripping meshes (SGM). In this article, 50 patients diagnosed by inguinal hernia dividing them into 2 equal groups (no=25) both operated using Liechtenstein; Group (A) patients operated using Adhesix™ SGM and group (B)-patients operated using ProGrip™ SGM. Our aim is to assess the results of using two different types of SGM during Liechtenstein. We used Mann–Whitney U test-OR for statistical analysis. The findings revealed that upon using Adhesix™ SGM; both operative time and post-operative pain which was decreased gradually upon using Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), were significantly reduced in comparison to using ProGrip™ SGM. No significant differences regarding average time of hospital stays and the incidence of complications during the Short-term follow-ups among both groups with no recurrences neither.

Keywords: Inguinal hernia, hernia repair, Lichtenstein, self-gripping mesh (SGM).

Introduction

The adhesiveness of self-gripping meshes (SGM) [1] is related to being double-sided [2]; first with small hooks made from multifilament-polyethylene-terephthalate (PET) [3] with monofilament-polypropylene (PP) [4], second with small allowing grips' attachment [5]. Moreover, Adhesix™ mesh is coated by polyethylene-glycol (PEG) and polyvinylpyrrolidone (PVP) [6], ProGrip™ possess micro-grips made of polylactic-acid (PLA) [7].

SGM during open anterior hernioplasty Liechtenstein [8] have avoided the drawbacks of sutured fixation [9]. Modifications upon SGM [10] included methods of spreading [11]; The four-fold and rolling techniques [12], Swiss-roll folding [13] mesh deployment technique [14], reduced operative-time and post-operative pain [15].

Materials and Methods

50 patients were included in our comparative clinical trial whom were divided into two equal groups; A & B (no=25). Non-pregnant patients aged between 21-71 years old with unilateral non-complicated primary inguinal hernia had fulfilled our inclusion criteria. Our comparative criteria included; operative-time, duration of hospital stays (beds/day) together with the

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incidence of complications during the postoperative period and during short-term follow-up for six months. We operated both groups using Liechtenstein tension-free open anterior hernioplasty.

For group (A) patients; we applied Adhesix™ SGM (Figure 1) and for group (B) patients; we applied Progrid™ SGM (Figure 2). The distribution of sexes, average age and hernial side are illustrated in (Table 1).

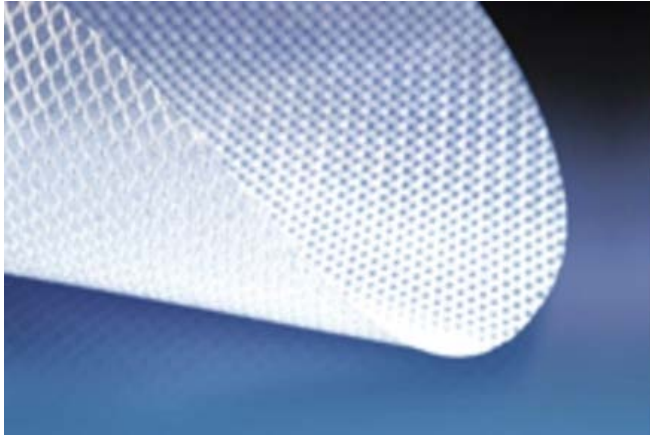


Figure 1: Adhesix™ SGM. Source [16]



Figure 2: Progrid™ SGM. Source [17].

Table 1: The count of patients, average of age and the sex of patients in each group.

	Count of patients	Average age (Years)
Adhesix™	25	51,9
Male	23(92%)	52,4
Left inguinal hernia	19(76%)	52,9
Right inguinal hernia	6(24%)	51,2
Female	2(8%)	45,5
Left inguinal hernia	2(100%)	45,5
Progrid™	25	57,2
Male	23(92%)	57,2

Left inguinal hernia	15(60%)	56,5
Right inguinal hernia	10(40%)	59,9
Female	2(8%)	52,5
Right inguinal hernia	2(100%)	52,5
Grand total	50	54,6

Results

1) Operative time

The analysis showed significant differences regarding the duration of the operation; using Adhesix™ SGM have reduced operative-time by almost 5 minutes in comparison to Progrid™ SGM (Average operative time was 25.7 minutes for group (A) versus 30.6 minutes for group (B). (Figure 3).

2) Hospital stays (beds/day)

We found no significant differences regarding the duration of hospitalization among both groups ($p=0.759$).

Mean hospital stays for Adhesix™ self-gripping mesh implants group - mean = 4.72, median = 5.0, Sd = 0.339.

Mean hospital stays for the Progrid™ self-gripping mesh implants group – mean = 4.56, median = 4.0, Sd = 0.259.

Report: 4.56 ± 0.259 vs 4.72 ± 0.339 days; $U=328$, $p=0.759$). (Table 3). (Figure 4).

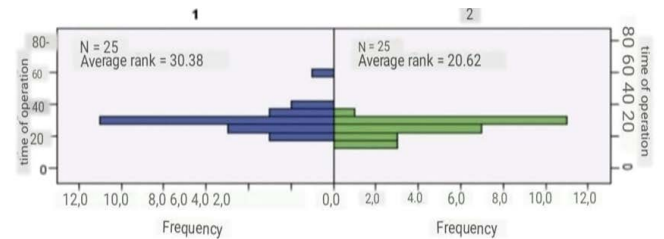


Figure 3: Mann-Whitney test for independent sample. Vertical axis; time of the operation (minutes), horizontal axis; mesh types (1; Adhesix™, 2; Progrid™). Data are presented as mean values \pm standard deviation, * - $p=0.016$, statistically significant differences relative to time of operation. Source [7]

For the Adhesix™ SGM group -average = 25.68, median = 27.0, Sd = 1.078.

For the Progrid™ SGM group -average operation time = 30.6, median = 30, Sd = 1.615.

Report: 30.6 ± 1.615 vs 25.68 ± 1.078 min; $U=190.5$, $p=0.016$). (Table 2).

Table 2: Ground total operative-time in both groups.

	Sum of time of operations (minutes)
Adhesix™	642
Progrid™	765
Grand total	1407

Table 3: Number of hospitals stays for both patients' groups.

	Sum of hospital stays (days)
Adhesix™	118
Progrid™	114
Grand total	232

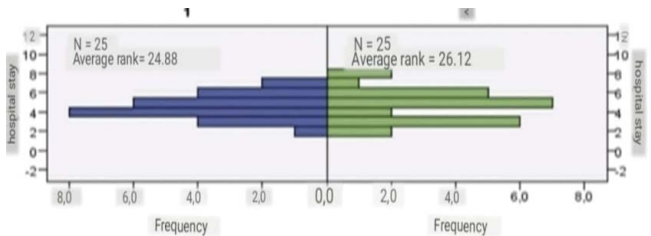


Figure 4: Mann-Whitney test for independent sample. Vertical axis; duration of hospital-stays (days); horizontal axis; mesh type (1; Adhesix™, 2; Progrid™). Data are presented as mean values ± standard deviation, * - p=0.7596 statistically no significant differences relative to duration of hospital-stays. Source [7].

3) Complication in the postoperative period

In group (A); The number of patients who had postoperative pain, which was relieved by analgesics, while in all other patients of this group, the pain gradually decreased when taking NSAIDs (OR = 1.000; CI 0.130 - 7.717; p=1.00) and other members of this group had surgical site infection. (OR = 0.92; CI 0.820 -1.033; p=0.149) are mentioned in § table 4. In group (B); The number of patients who had postoperative pain, which was relieved by analgesics, while in all other patients of this group the pain was gradually reduced when taking NSAIDs (OR = 1.000; CI 0.130 - 7.717; p=1.00) and other members of this group had surgical site infection. (OR = 1.087; CI 0.968 - 1.220; p=0.149) are also mentioned (Table 4).

Table 4: Number of postoperative complications in both groups.

	Free of complications	Post-operative pain	Infection	Grand total
Adhesix™	23/25(92%)	2/25(8%)	0/25(0%)	25
Progrid™	21/25(84%)	2/25(8%)	2/25(8%)	25
Grand total	44/50(88%)	4/50(8%)	2/50(4%)	50

Table 5: Incidence of complications in 6-months follow up for both groups.

	Chronic pain	Foreign body sensation	Seroma	Ground total
Adhesix™	0/25(0%)	0/25(0%)	0/25(0%)	0/25(0%)
Progrid™	0/25(0%)	0/25(0%)	0/25(0%)	0/25(0%)
Grand total	0/50(0%)	0/50(0%)	0/50(0%)	0/50(0%)

4) Complications during the short-term follow-up for six months

For group (A); All patients were satisfactory without any complications or recurrences (OR = 0.92; CI 0.820 -1.033; p=0.149), the number of patients with chronic pain in the surgical area, foreign body sensation and seromas are mentioned. (Table 5).

For group (B), we also found all patients were satisfactory without any complications or recurrences (OR = 1.087; CI 0.968 -1.220; p=0.149), the number of patients with chronic pain in the surgical area, foreign body sensation and seromas are mentioned (Table 5).

Discussion

Regarding our study questions; Is there any significant differences between Adhesix™ SGM and Progrid™ SGM regarding operative-time??? duration of hospital stays??? the incidences of complications and hernia recurrences during the post-operative period and the short-term follow-up??? We obtained the following answers:

1. The duration of the operation using the Adhesix™ SGM was significantly reduced in comparison to the use of Progrid™ SGM.
2. There are no significant differences regarding the duration of hospitalization among both groups.
3. The use of both SGMs; Adhesix™ & Progrid™ did not increase the risk of postoperative pain and is not associated with an increased risk of surgical site infection.
4. The use of both SGMs; Adhesix™ and Progrid™ did not show any complications (chronic pain, foreign body sensation, seroma formation) or recurrences during short-term follow-up for six months.

Controversies raised by this study; Is there is a correlation between Progrid™ SGM and increased incidence of surgical site infection incomparison to the use of Adhesix™ SGM??? Which may need further future studies to interpretate this query. In another words; Does the micro-grips involved the structure of Progrid™ SGM responsible for such drawback??? For further investigations.

Author contribution

Concept and design: MMSF, SSMA, PAV; Review of literature: MMSA, SSMA; Drafting the article and figure preparation: MMSA, SSMA; Revising and editing the manuscript: MMSF. Final approval of the article: MMSA, SSMA, PAV.

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Competing Interests

All the authors have read the manuscript and declare no conflict of interest. No writing assistance was utilized in the production of this manuscript.

Consent for publication

All the authors have read the manuscript and consented for publication.

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