

## Research Article

# Comparison of early complications using regular mesh versus Atramat® Neoflex 25 mesh in inguinal, umbilical and post incisional hernias

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## ABSTRACT

**Background:** Hernias are one of the most common reasons of primary health care with subsequent surgery and this has led to search new techniques to approach them. Comparing traditional techniques with polypropylene mesh versus one bioabsorbible mesh there has been a decrease in postoperative complications.

**Methods:** 100 patients with inguinal hernia, umbilical and post incisional were surgically intervened and divided into two groups according to mesh material used. The patients were tracked for two months after surgery.

**Results:** Traditional mesh was used to repair hernias in 50 patients and Atramat® Neoflex 25 mesh was used in the other half. Two patients developed infection with traditional mesh and one patient using Atramat® Neoflex 25 mesh (p 0.558). Hernias recurred in 4 patients with traditional mesh compared with 0 patients with Atramat® Neoflex 25 mesh (p .041), seroma formation was found with a 6: 1 ratio, traditional mesh: Atramat® Neoflex 25 mesh (p .050) and hematoma in a 2:1 ratio (p .558). The total of complications showed a total of 14 using traditional mesh and 3 with Atramat® Neoflex 25 mesh. The use of mesh made from absorbable materials is a better alternative to reduce chronic pain and recurrence due to its high biocompatibility.

**Conclusions:** Using Atramat® Neoflex 25 mesh demonstrated a significant reduction of complications (recurrence and seroma formation) and length of hospital stay (2 days vs 1 day in abdominoplasty after surgery).

**Keywords:** Inguinal hernia, Surgery, Surgical mesh, Absorbable mesh, Treatment outcome

## INTRODUCTION

Inguinal hernia repairs are one of the most common surgical procedures in adults and children,<sup>1</sup> defining an inguinal hernia like a protrusion of an organ or abdominal contents through an opening of the abdomen in the inguinal region.<sup>2</sup> Inguinal hernias are one of the most

common reasons of primary care and possible surgical evaluation.

It is estimated that up to 25 % of American men will develop an inguinal hernia at some point in their lives.<sup>3</sup> Although there are several types of hernia, about 75 % occur in the inguinal region, and the diagnosis is usually

made through medical history and findings on physical examination. Hernias affect both male and female, sometimes causing the loss of the testicles ovaries or any portion of the intestine if incarceration or strangulation occurs.

One of the biggest we still face is the recurrence of inguinal hernias despite different treatments and kinds of mesh. It has been reported that up to 13 %<sup>4</sup> of the procedures performed to treat a recurrence of an inguinal hernia, identifying among the risk factors for recurrence of inguinal hernia: anesthesia methods, techniques of mesh attachment, surgeon experience, gender patient, type of hernia, genetics, anatomical malformations of the abdominal wall, composition of connective tissue, smoking and postoperative care, impacting each in varying degrees for recurrence.<sup>2,5</sup>

The National Health Information System in Mexico, reported from 2000 to 2007 approximately 282,105 cases of abdominal wall hernia repairs, being one of the most common procedures in the General Surgery and Pediatric Surgery Departments. 10 to 15% of the population is affected with this entity, having direct economic consequences in almost 25% of the economically active population.<sup>6</sup>

In a metaanalysis of Burschart and cols,<sup>2,7</sup> the predisposing factors to have a recurrence after an inguinal hernia repair are: Female gender (RR 1.38), presence of a direct inguinal hernia (RR 1.91), recurrent inguinal hernia repaired surgically (RR 2.2) and smoking (OR 2.53).

The conjunctive tissue is important for the formation and recurrence of inguinal hernias, especially in alteration involving procollagen, collagen and MMP.<sup>8-11</sup>

New techniques are proposed to reduce recurrence of inguinal hernias and to prevent early or chronic complications.<sup>12</sup> The two general therapeutic options are the inguinal plasty or herniorrhaphy, being the inguinal plasty the most common procedure nowadays with a lower recurrence rate than herniorrhaphy.<sup>13,14</sup>

Due to the fibrosis generated in inguinal hernias repairs, complications such as chronic pain occurs due to the rigidity of the mesh, and new meshes are associated with less inflammatory response and more elasticity and flexibility.<sup>15,16</sup> Since 1999 there are biologic meshes gaining popularity due to the lack of sutures for fixation, diminishing operating time, chronic pain, recurrence rate, complications and the possibility to use them in an infected environment or with an incarcerated hernia.<sup>17</sup>

Comparing the use of traditional polypropylene mesh with a bioabsorbible mesh that eliminates the use of sutures shows a reduction of nerve lesions due to the lack of points of fixation and therefore a reduction in pain.<sup>18,19</sup> (Table 1).

The most frequent complications after a hernia repair are: bleeding, infection, seroma formation, chronic pain and recurrence.<sup>20</sup>

**Table 1: Comparison between biologic absorbable meshes Vs synthetic non-metallic meshes.**

Biologic absorbable meshes	Non-metallic synthetic meshes
- Stable initial closure.	- Stable closure
- Easier fluid drainage	- Easier fluid drainage
- Faster cicatrization	- Higher recurrence of infection
- Lesser evisceration	- Higher recurrence of evisceration
- Higher resistance to infection	- Higher recurrence of chronic pain
- Higher resistance to tension	
- Faster recovery	

## METHODS

One hundred patients with bilateral or unilateral inguinal hernia (n=20 patients), umbilical hernia (n=20), post incisional abdominal hernia (n=60) were followed for 2 months after a hernia repair. All the repairs were performed by the same surgeon with the same surgical technique depending on the group. Two groups were created randomly. Group A had traditional mesh repair and Group B had Atramat® Neoflex 25 mesh for the surgical repair.

Inclusion criteria were patients with inguinal hernia (unilateral or bilateral), umbilical hernia, post incisional hernia and age more than 10 and less than 75. Infection, recurrence rate, seroma formation, hematoma formation and length of hospital stay were followed.

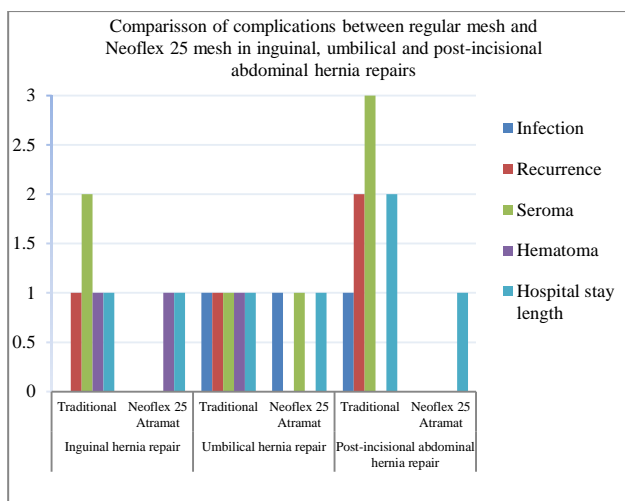
### Statistical analysis

Data recollection was performed with Microsoft Excel 2012. Means were compared and percentages were determined and chi-square test was performed.

## RESULTS

One hundred patients were operated (Figure 1) with the next distribution: 20 inguinal hernia repairs with 10 patients using traditional repair with mesh and 10 patients using Atramat® Neoflex 25 mesh, 20 umbilical hernia repairs with 10 patients using traditional repair with mesh and 10 patients using Atramat® Neoflex 25 mesh and 60 patients with post-incisional abdominal hernias with 30 patients using a traditional repair with mesh and 30 patients using Atramat® Neoflex 25.

Two patients had infection in the traditional mesh group and 1 patient in the Atramat® Neoflex 25 group without significant statistical difference (p.558).



**Figure 1: Comparison of complications between regular mesh and Neoflex 25 mesh in inguinal, umbilical and post-incisional abdominal hernia repairs.**

Four patients presented with recurrence with the traditional mesh and 0 patients in the Atramat® Neoflex 25 mesh group (p. 041). These recurrences were as follow: 1 in the inguinal hernia repair group, 1 in the umbilical hernia repair group and 2 in the post-incisional abdominal hernia repair.

Six patients had seroma in the traditional mesh group repair and 1 in the Atramat® Neoflex 25 mesh repair group (p 0.050).

Two patients had hematoma formation in the traditional mesh repair group and 1 in the Neoflex mesh repair group without significant difference (p 0.558).

Total complications (17) were 14 in the traditional mesh repair group and 3 in the Atramat® Neoflex 25 hernia repair group.

The mean length of stay was of 1 day in the inguinal and umbilical hernia regardless of the technique performed. The mean length of stay in the post-incisional abdominal hernias was 2 days with the traditional mesh repair compared with 1 day in the Atramat® Neoflex 25 mesh repair.

## DISCUSSION

Using absorbible meshes that facilitates the tissue fixation without sutures is a new therapeutic possibility for hernia repairs. One of the most important characteristic is that this kind of mesh is associated with less risk of infection.<sup>21</sup>

Also this kind of absorbible mesh is a great alternative to diminish chronic pain and also recurrences. The advantage of the absorbible mesh against the synthetic

mesh is due to the reduction of infection or rejection. One of the main points of chronic neuralgia is the method of fixation of the mesh that tries to avoid sutures and some studies have demonstrated greater chance of pain and strange body sensation after the conventional mesh repair.<sup>22</sup>

One of the main characteristic of the absorbable meshes is the property of the progressive degradation in the host.<sup>23</sup>

Tissue reparation is optimal when using absorbable meshes and is well known due to the biocompatibility that it represents.<sup>24</sup>

## CONCLUSION

We found a significant decrease in complications (recurrence and seroma formation) and also a lesser hospital stay length ( 2 days Vs 1 day in post-incisional abdominal hernia) using the Atramat® Neoflex 25 mesh against regular traditional mesh.

During the last years, hernia repairs have been an interesting topic, leading to propose new surgical techniques such as laparoscopic or open approach, or using absorbable meshes such as the one we used in this study. The preoperative prophylactic antibiotic use is recommended when planning to use a mesh.

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